Appendix A

Interim Record of Decision

Appendix A to the Consent Decree

INTERIM RECORD OF DECISION

SAN GABRIEL VALLEY SUPERFUND SITE
EL MONTE OPERABLE UNIT
LOS ANGELES COUNTY, CALIFORNIA

June 1999

United States Environmental Protection Agency
Region IX - San Francisco, California

Contents

Contents

Contents

Contents

Contents

Page

Tables

Figures

Part I
Declaration

Part I - Declaration

1.1 Site Name and Location

This Interim Record of Decision (ROD) addresses groundwater contamination at the El Monte Operable Unit (El Monte OU) located within the San Gabriel Valley Superfund Site Area 1 in Los Angeles County, California.

1.2 Statement of Basis and Purpose

This ROD presents the selected interim remedial action for the El Monte OU of the San Gabriel Valley Superfund Site in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. §§ 9601 et. seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) (collectively referred to herein as CERCLA) and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300 (NCP). This decision is based on the Administrative Record for this site.

The State of California, acting through the California Department of Toxic Substances Control (DTSC) and the Los Angeles Regional Water Quality Control Board (RWQCB), concur with the selected remedy.

1.3 Assessment of the Site

EPA has determined that volatile organic compounds (VOCs) have been released into groundwater within the El Monte OU, and that a substantial threat of release to groundwater still exists. The response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

1.4 Description of the Selected Remedy

This interim action ROD addresses groundwater contaminated with VOCs. EPA's objective is to protect human health and the environment. The selected remedy is containment of groundwater contaminated with VOCs in the shallow and deep zones in the El Monte OU to prevent further migration of existing groundwater contamination. This remedy includes performance criteria that will require extraction and treatment of contaminated groundwater at certain locations along the downgradient edge of the contamination and will require continued monitoring and evaluation at other locations. Most likely, the treated groundwater will be discharged to Eaton Wash (more probable for shallow groundwater) or provided to local water purveyors (more probable for deep groundwater). Other discharge options may be evaluated. In addition, this remedy includes monitoring in the shallow and deep groundwater zones in the El Monte OU. This remedy is one of five interim remedial actions that are under evaluation or have been selected to contain contaminated groundwater plumes within the San Gabriel Valley Superfund Sites.

1.5 Statutory Determinations

The selected interim action remedy is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to the interim remedial action, is cost effective, and utilizes permanent solutions to the maximum extent practicable. This remedy also satisfies the statutory preference for treatment as a principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of materials through treatment).

Because this interim remedy will result in hazardous substances remaining onsite above health-based levels and does not limit groundwater use or restrict exposure, a review will be conducted at least once every five years after commencement of the interim remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

1.6 ROD Data Certification Checklist

The following information is presented in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record file for this site.

- Chemicals of concern (COCs) and their respective concentrations
- Baseline risk represented by the COCs
- Current and future groundwater use assumptions used in the baseline risk assessment and ROD
- Groundwater use that will be available at the site as a result of the selected remedy
- Estimated capital, operation and maintenance (O&M), and total present worth costs; discount rate; and the number of years over which the remedy cost estimates are projected
- Decisive factors that led to selecting the remedy (i.e., how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria)

Cleanup levels in the aquifer are not included in this interim action ROD because this is an interim action remedy focused on groundwater containment.

Keith A. Takata
Director of Superfund Division
U.S. Environmental Protection Agency, Region IX

Date

111

Part II
Decision Summary

Part II - Decision Summary

This Decision Summary portion of the interim Record of Decision (ROD) summarizes the information and approaches that the U.S. Environmental Protection Agency (EPA) used to reach a decision on this remedy. It also establishes the remedy that EPA has selected.

1 Site Name, Location and Description

This ROD presents EPA's selected remedial action to address groundwater contamination at the El Monte Operable Unit (El Monte OU) located within the San Gabriel Valley Superfund Site Area 1 in Los Angeles County, California.

1.1 Site Description

The El Monte OU is part of the San Gabriel Valley Superfund Site Area 1, located in eastern Los Angeles County, California (Figure 1). The term "Operable Unit" (OU) is used to define a discrete action that is an incremental step toward a comprehensive site remedy. Operable units may address certain geographic areas, specific site problems, initial phases of a remedy, or a set of actions over time. In addition to the El Monte OU, EPA has identified other OUs at the San Gabriel Valley Superfund Site. These are the Baldwin Park OU, Alhambra OU, Puente Valley OU, Richwood OU, South El Monte OU, Suburban OU, and Whittier Narrows OU. EPA is the lead regulatory agency overseeing the cleanup at the San Gabriel Valley Superfund Site. The San Gabriel Valley Superfund Site Area 1 has a CERCLIS ID CAD980677355.

The San Gabriel Valley encompasses a basin that is approximately 170 square miles. Groundwater in the San Gabriel Basin is the primary drinking water source for more than one million people. Regional groundwater contamination by volatile organic compounds (VOCs) prompted EPA to place the San Gabriel Valley on the National Priorities List (NPL) in 1984. This list identifies the highest priority hazardous waste sites in the United States for investigation and cleanup.

The El Monte OU covers approximately 10 square miles in the south central portion of the San Gabriel Basin. The El Monte OU is generally bounded by the San Bernardino Freeway (Interstate 10) on the south, Rosemead Boulevard on the west, and Santa Anita Avenue and the Rio Hondo on the east. The El Monte OU is highly developed and lies within the cities of El Monte, Rosemead, and Temple City. Most of the area is zoned for residential use and is likely to remain residential. Industrial activity in the El Monte OU is primarily concentrated in the central portion of the OU.

Groundwater flow in the El Monte OU is principally from east to west. However, there is also a southerly component of groundwater flow in the eastern portion of the OU. Both of the aquifer zones (shallow and deep) in the El Monte OU are considered to be drinking water sources by the State of California and the deep zone is currently used for drinking water. VOCs are the primary organic contaminants found above state and federal drinking water standards (maximum contaminant levels or

MCLs) in the El Monte OU. Tetrachloroethene (PCE) and trichloroethene (TCE) are the VOCs that have been detected most often in groundwater, although other VOCs, including 1,2-dichloroethane (1,2-DCA), 1,1-dichloroethane (1,1-DCA), cis-1,2-dichloroethene (cis-1,2-DCE), 1,1-dichloroethene (1,1-DCE), and carbon tetrachloride (CCl_4) have also been detected above drinking water standards in the El Monte OU. In general, VOC concentrations are highest in the shallow groundwater in the vicinity of industrial facility source areas where releases have occurred. VOCs have also spread downward into the deep zone beneath the shallow zone, then migrated downgradient in the deep zone towards drinking water production wells. Several drinking water wells in the El Monte OU have been impacted by VOC contamination. These wells have had to be shut down or equipped with wellhead treatment to reduce contaminant levels. To address the industrial areas that contain the sources of groundwater contamination, the Los Angeles Regional Water Quality Control Board (RWQCB), with funding from EPA, oversees site-specific investigations and cleanups at facilities where releases have occurred. Figures 2 and 3 show 1997 VOC concentrations in the shallow and deep zones.

2 Site History and Enforcement Activities

2.1 Site History

The San Gabriel Valley has been the subject of environmental investigation since 1979 when groundwater contaminated with VOCs was first identified. In May 1984, four broad areas of contamination within the basin were listed as San Gabriel Areas 1 through 4 on EPA's NPL. EPA subsequently divided the basin into eight operable units (OUs) to provide a means of describing hydrogeology and contaminant distribution, and planning remedial activities in the basin. The source of groundwater contamination in the basin is from industrial facilities.

In 1986, data were compiled and reviewed to develop a preliminary conceptual hydrogeologic model of the San Gabriel Valley, as described in the Supplemental Sampling Program (SSP) Report (EPA, 1986). The results of the SSP investigations provided much of the basis for planning the remedial investigations that have been performed in the San Gabriel Valley since 1986. The Interim San Gabriel Basin Remedial Investigation Report (EPA, 1992a) describes these investigations and incorporates their results into an integrated discussion of EPA's understanding of hydrogeologic conditions in the basin.

EPA issued a draft Statement of Work (SOW) for a remedial investigation and feasibility study (RI/FS) to address the El Monte OU. On March 16, 1995, EPA entered into an Administrative Order on Consent (AOC) with the Northwest El Monte Community Task Force (NEMCTF), a group of PRPs in the El Monte OU, in which the NEMCTF agreed to perform the investigation detailed in the final SOW.

Sources of groundwater contamination in the El Monte OU include industrial facilities engaged in the manufacture of electronic, aviation, navigational, and vibration analysis equipment, aircraft flooring, glass container, generators, high precision instruments, precision sheet metals, spring coils, nails, industrial paint, flow meters, name plates, gazebos, and patio furniture; paper printing; metal plating; chemical handling and transfer; and dry cleaning.

2.2 Remedial Investigation Activities

EPA developed the RI/FS process for conducting environmental investigations under Superfund. The RI/FS approach is the methodology that the Superfund program has established for characterizing the nature and extent of risks posed by uncontrolled hazardous waste sites to evaluate potential remedial options. The RI serves as a mechanism to collect data for site characterization. The FS serves as the mechanism for development, screening, and evaluation of potential remedial alternatives.

As stated in the Statement of Work, the RI/FS was designed to meet the following goals:

> Assess aquifer characteristics and characterize the vertical and lateral distribution of concentrations of VOCs in groundwater in the El Monte OU area to support a focused FS and the selection of one of more interim actions for the El Monte OU area.

Develop and analyze alternatives for appropriate interim remedial actions to control the vertical and horizontal migration of groundwater with relatively higher concentrations of VOCs to areas in the El Monte OU with relatively lower concentrations of VOCs.

An RI field program was conducted for the El Monte OU during the period from September 1996 through November 1997. In addition, a production wells investigation was conducted from mid-1995 through early-1996 by the NEMCTF. The RI field program consisted of shallow and deep (multi-port) monitoring well installation, groundwater monitoring and aquifer testing. The final RI Report was submitted to EPA in April 1998.

An FS was performed for the El Monte OU in 1997 and 1998. The FS identified remedial action objectives, assembled remedial action alternatives, and provided an evaluation of the remedial action alternatives using the nine Superfund evaluation criteria established by EPA. The final FS Report was submitted to EPA in July 1998.

2.3 Enforcement Activities

EPA began its enforcement efforts in the El Monte OU in 1985 by searching historical federal, state, and local records for evidence of chemical usage, handling, and disposal in the El Monte OU area. At approximately the same time, the RWQCB initiated its Well Investigation Program (WIP) to identify sources of groundwater contamination. In 1989, EPA entered into a cooperative agreement with the RWQCB to expand the WIP program, to assist EPA in determining the nature and extent of the sources of groundwater contamination in the San Gabriel Valley, and to identify responsible parties. The RWQCB directly oversees facility-specific investigations in the El Monte OU area; EPA helps fund these activities and, when necessary, uses its enforcement authority to obtain information and ensure that facility investigations are promptly completed.

As of March 1999, the RWQCB has sent chemical use questionnaires to approximately 231 facilities in the El Monte OU area; inspected approximately 228 of these facilities; and directed approximately 73 facilities to perform soil, soil gas, and/or groundwater investigations. EPA has concurrently used its authority under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to request information from more than 110 current and former owners and operators in the El Monte OU. From these investigations, EPA has identified 20 facilities as sources of groundwater contamination for the El Monte OU.

From 1990 through 1994, EPA sent General Notice of Liability letters to approximately 40 entities in and around the El Monte OU area. On October 7, 1994, EPA sent Special Notice letters to 17 potentially responsible parties (PRPs), requesting that these parties present a good faith offer to perform the RI/FS for the El Monte OU. Fifteen of these PRPs formed the NEMCTF and in March 1995 entered into an AOC with EPA to conduct the RI/FS. In May 1995, EPA issued a Unilateral Administrative Order (UAO) to one PRP, Crown City Plating, that failed to present a good faith offer. Crown City Plating completed the activities that the UAO required in 1997, and the NEMCTF completed the RI/FS in July 1998.

Since 1995, EPA and the RWQCB have continued to investigate potential sources of contamination. In August and October 1997, EPA notified 4 additional entities that they had been identified as PRPs. EPA is now in the process of identifying a final group of PRPs for the El Monte OU. EPA anticipates issuing Special Notice letters to the El Monte OU PRPs after the ROD is issued; however, EPA may offer to settle with some of the smaller PRPs in lieu of issuing Special Notice letters.

EPA and the RWQCB have undertaken enforcement activities elsewhere in the San Gabriel Valley, including facility investigations, issuance of CERCLA section 104(e) requests for information, issuance of General and Special Notice letters, and filing of cost recovery litigation. PRPs in the Puente Valley and South El Monte OUs have entered into Administrative Consent Orders to perform the RI/FS activities for their respective OUs. EPA also issued a UAO to two parties in the Puente Valley OU. In the Baldwin Park OU, EPA issued a ROD in March 1993, and in May 1997 sent Special Notice letters to 19 PRPs seeking performance of the remedial design and remedial action (RD/RA). Soon thereafter, perchlorate contamination was discovered in the Baldwin Park OU, leading EPA to extend the deadline for the submission of a good faith offer to July 1999.

3 Community Participation

The Proposed Plan for this remedy, in the form of a fact sheet, was distributed to the parties on EPA's mailing list for the El Monte OU in October 1998. The Proposed Plan, together with the Final El Monte OU RI (CDM, 1998a) and FS (CDM, 1998b) reports and other pertinent documents, were also included in the Administrative Record file available at EPA's Superfund Records Center at EPA's Regional Office in San Francisco, and locally at two information repositories: the West Covina Library and the Rosemead Library. The Administrative Record for the El Monte OU was placed in CD-ROM format in each repository.

In addition, EPA held a public meeting to present the Proposed Plan and EPA's preferred alternative on November 18, 1998, at the South El Monte High School in South El Monte, California. At this meeting, EPA answered questions and accepted oral comments pertaining to the El Monte OU and the preferred alternative. A transcript of this meeting is available at the EPA's Superfund Records Center and at the two information repositories.

Notice of EPA's public meetings, availability of the Proposed Plan, and the announcement of a 60-day public comment period was published in the following newspaper:

- San Gabriel Valley Daily Tribune October 26, 1998

The public comment period ran from October 26 to December 26, 1998. EPA received several sets of written comments during the public comment period. These comments and the significant oral comments are addressed in the Responsiveness Summary, included as Part III of this ROD.

4 Scope and Role of Operable Unit

There are four areas of groundwater contamination in the San Gabriel Basin aquifer listed on the NPL as San Gabriel Valley Areas 1 through 4. Groundwater contamination in the San Gabriel Valley extends over very large areas (approximately 30 square miles). In the valley, there are a number of different areas of contamination with distinct conditions and contaminant sources. To facilitate implementation of remedial actions, EPA has divided the site into eight different OUs (Figure 1):

- Alhambra OU- RI/FS underway
- Baldwin Park OU- ROD signed, EPA is negotiating with PRPs to implement remedy
- **El Monte OU- Subject of this ROD**
- South El Monte OU- Nearing completion of the RI/FS process
- Whittier Narrows OU- Previous groundwater monitoring only ROD, EPA is currently preparing a ROD Amendment
- Suburban OU- No action remedy selected in ROD.
- Richwood OU- State has taken the lead on implementing the water supply remedy
- Puente Valley OU- ROD signed, EPA is negotiating with PRPs to implement remedy

The El Monte OU remedial action selected in this ROD is classified as an interim action because it is intended to control the migration of contamination. Additional remediation may be needed to clean up VOC contamination remaining in the groundwater. EPA will use information collected during operation of the selected remedy to help determine the need for additional actions and the nature of the final remedy. The final remedy may include additional remedial actions at or in the vicinity of industrial facilities identified as groundwater contamination sources in the El Monte OU. This interim action will neither be inconsistent with, nor preclude, implementation of the final remedy. The OU-specific actions currently being undertaken in the San Gabriel Valley are primarily interim actions. It is anticipated that a final ROD will be issued for the entire San Gabriel Valley Superfund site once remedial design/remedial action (RD/RA) implementation has been initiated at all of the individual OUs.

5 Site Characteristics

5.1 Location and Topography

The El Monte OU lies in the central portion of the San Gabriel Valley (Figure 1), approximately 25 miles from the Pacific Ocean, in eastern Los Angeles County. Located within the San Gabriel Valley is the San Gabriel Basin, a broad piedmont plain that slopes gradually to the southwest at a gradient of approximately 65 feet per mile (California Department of Water Resources {CDWR}, 1966). This structural basin is a natural ground-water reservoir that collects rainfall on the valley floor and run-off from the surrounding highlands, recharging the groundwater aquifer.

The San Gabriel Basin is bounded to the north by the San Gabriel Mountains and to the southwest, south, and southeast by a crescent-shaped system of low hills. The hills making up the system, from west to east, are the Repetto, Merced, Puente, and San Jose Hills. The only significant break along this boundary falls between the Merced and Puente Hills at Whittier Narrows. Whittier Narrows is the lowest point in the San Gabriel Valley and is the exit for the San Gabriel and Rio Hondo Rivers and their tributaries, which serve as the drainage system for the valley.

The El Monte OU covers a surface area of approximately 10 square miles. The OU is not defined by any significant physiographic features, though the eastern boundary is roughly adjacent to the Rio Hondo. The El Monte OU varies from approximately 340 feet mean above sea level (MSL) in the northeast to 260 feet above MSL in the southeast.

Santa Anita Avenue defines the eastern boundary of the El Monte OU. The western and southern boundaries coincide with Rosemead Boulevard and the San Bernardino Freeway (Interstate 10), respectively. Several streets that traverse a residential area between Lower Azusa Road and Live Oak define the northern boundary.

Most of the annual precipitation in the El Monte OU occurs intermittently during the winter months of December through March. The long-term average precipitation for the San Gabriel Basin is about 18 inches per year. Temperatures are usually moderate; the average annual temperature in the San Gabriel Valley is about 62 degrees Fahrenheit (°F). January and July are the coldest and warmest months of the year, respectively.

5.2 Surface Water

Two major stream systems carry surface flow from the San Gabriel Valley: the San Gabriel River and the Rio Hondo and their tributaries. The headwaters for these two systems are in the San Gabriel Mountains. The systems transverse the San Gabriel Valley in a southwesterly direction and exit the valley at Whittier Narrows. Except in the case of significant storms, these channels do not carry much natural run-off. There is considerable non-natural flow from wastewater plant discharge, imported surface water intended for groundwater recharge.

Nearly all of the stream channels comprising the surface water drainage of the San Gabriel Valley have been modified and concrete-lined (including the Rio Hondo and its tributaries in the El Monte OU vicinity). This lining minimizes recharge of the aquifer by surface water flow.

The Rio Hondo and Eaton Wash are the major surface water features crossing the El Monte OU and vicinity areas. The Rio Hondo drains the northwest portion of the San Gabriel Valley. The Rio Hondo traverses the El Monte OU from the northeast to the south and is roughly adjacent to the eastern boundary. The Eaton Wash crosses the western portion of the El Monte OU from the north to the south, where it joins the Rio Hondo beyond the southern boundary of the OU. Most of the flow in the Rio Hondo is diverted into the Peck Road Spreading Grounds just north of the El Monte OU, so significant flow in the Rio Hondo through the El Monte OU is limited to substantial storm events.

5.3 Geology

5.3.1 San Gabriel Basin

The San Gabriel Basin is filled with alluvial deposits, primarily of Quaternary age, which overlie relatively impermeable rock. These deposits are 2,000 to 4,000 feet thick over the center of the basin and range between approximately 250 to 800 feet thick at the basin outlet in Whittier Narrows.

There are two distinct sources of sediment in the basin: the coarse-grained crystalline rocks of the San Gabriel Mountains and the finer-grained sedimentary rocks of the hills to the southeast and southwest. Sediment derived from the San Gabriel Mountains to the north is generally coarser-grained than that from the hills to the south. Consequently, hydraulic conductivity of the alluvium generally increases with proximity to the San Gabriel Mountains. The distribution of the sediments deposited in the basin is also controlled by the position relative to river and tributary courses. In particular, coarse-grained sediments are prevalent in the San Gabriel River proximity. Most of the San Gabriel Basin is characterized by interfingering lenses of alluvial deposits (e.g., cobbles, gravel, silt, and clay) and the alluvial deposits show a high degree of variability in sediment type, both vertically and laterally.

Major structural features controlling regional ground-water flow in the San Gabriel Basin include the topographic highs (i.e., San Gabriel Mountains and southern hills) and topographic lows (i.e., Whittier Narrows). Four major faults in the San Gabriel Basin potentially impact ground-water flow: the Sierra Madre Fault System, the Raymond Fault, the Lone Hill-Way Hill Fault, and the Workman Hill Fault.

5.3.2 El Monte OU

Most of the El Monte OU is located west of the Rio Hondo, where the alluvial deposits are more stratified. A small portion of the OU is located east of the Rio Hondo in an area with coarser river deposits.

Significant intervals of silty or clayey soils have been noted at a number of locations in the El Monte OU, including the locations of deeper monitoring wells installed during the El Monte OU RI. The subsurface materials encountered during the RI consisted of interbedded gravels, sands, silts and clays. The majority of the silts and clays were encountered in the upper 100 feet below grade.

There do not appear to be any areally extensive uniform aquitards, however, there are considerable finer-grained sediments present in the general depths of 90 to 120 feet bgs. The sediments in the eastern portion of the OU area, proximal to the Rio Hondo, are coarser-grained, consisting predominantly of sands and gravels with interbedded silts and clays. Toward the western edge of the OU, the materials become less coarse, with silty sands and sands predominating. Because of the fluvial nature of the depositional environment, the lithologic logs do not correlate well, even over short distances.

5.4 Hydrogeology

5.4.1 San Gabriel Basin

The San Gabriel Groundwater Basin comprises approximately 167 square miles of water-bearing valley land (CDWR, 1966). The maximum depth of alluvial fill within the main basin is unknown, though CDWR (1966) shows an alluvial depth of more than 4,000 feet at a location north of Whittier Narrows (CDWR, 1966).

Natural features that control the regional pattern of groundwater movement in the San Gabriel Basin include topographic highs (San Gabriel Mountains and southern hills) and lows (the valley floor, especially Whittier Narrows), and to some extent faults. Generally, groundwater in the basin flows from topographically high to low areas in the absence of groundwater pumping. In addition, groundwater flow is also controlled by the locations of significant recharge, such as undeveloped alluvial fans, riverbeds and spreading basins. Recharged groundwater moves away from these areas, generally towards topographically lower areas. Under natural groundwater flow conditions, such as those encountered in the first half of this century, groundwater generally flowed away from the margins of the basin towards the center of the alluvial valley, and then towards Whittier Narrows (EPA, 1992a).

In parts of the basin, concentrated groundwater withdrawal by pumping significantly affects the direction and rate of groundwater flow. With the increased use of wells to extract groundwater from the basin, the pattern of groundwater flow in the basin has changed over time (EPA, 1992a). About 80 percent of the groundwater discharge from the San Gabriel Basin is now to production wells (EPA, 1992a). The remaining groundwater discharge consists of subsurface outflow through Whittier Narrows and minimal discharge to surface water in Whittier Narrows and Puente Valley.

5.4.2 El Monte OU

As noted above, there do not appear to be any areally extensive aquitards in the El Monte OU area, but there are considerable fine-grained sequences present, particularly in the general depths between 90 and 120 feet bgs. The unconsolidated deposits in the El Monte OU are of fluvial origin and consist of interbedded sediments comprised of gravel, sand, silt, and clay and mixtures of these materials.

Depth-to-water in the El Monte OU at the end of the RI was between 50 and 60 feet below ground surface (bgs) in the eastern portion of the OU, approximately 110 feet bgs along the western boundary of the OU and less than 40 feet near the southern OU boundary.

Based on the lithologic, water-level, and contamination data generated during the RI, the aquifer in the El Monte OU area has been divided into a shallow zone (representing approximately the upper 50 to 100 feet of the aquifer) and a deeper zone (representing the interval from base of the shallow zone down to approximately 400 feet bgs).

5.4.2.1 Hydraulic Conductivity

Hydraulic conductivity is a measure of how easily fluids can flow through porous media. The geologic materials in the El Monte OU vary from clay to gravel over short distances, thus estimates of hydraulic conductivity in the area are very location- and scale-dependent. During the RI, aquifer tests were performed at deeper production wells and shallow monitoring wells.

Average conductivity estimates for the deep production wells tested ranged from 11 to 22 feet/day for the wells west of the Rio Hondo and 71 ft/day for the one well located east of the Rio Hondo. Tests of three shallow site assessment wells in the El Monte OU yielded conductivity estimates ranging from 3 to 106 ft/day.

The aquifer testing performed during the RI indicates that hydraulic conductivity values are similar in the shallow and deep zones and are generally less than 50 ft/day.

5.4.2.2 Groundwater Flow Conditions

Groundwater flow is described below in terms of flow direction and gradient, both in the horizontal and vertical dimensions. Horizontal flow is discussed for the shallow zone, where higher levels of VOC contamination occur, and the deep zone, where lower levels of VOC contamination occur.

Within the river deposits generally east of the Rio Hondo (and east of the El Monte OU), the direction of groundwater flow in the shallow zone is generally southwestward towards Whittier Narrows. The flow direction in the shallow zone in the western portion of the El Monte OU is predominantly from east to west, presumably as a result of influences from deeper pumping west of the OU. In the eastern portion of the OU, just west of the Rio Hondo, groundwater flow directions in the shallow zone vary considerably, but the net flow direction is towards the south. The hydraulic gradient towards the west in the shallow zone ranged from 0.0028 to 0.0036 feet per feet during the RI. Using average gradient and hydraulic conductivity values described above for the shallow zone results in estimated groundwater velocities of between 40 and 120 feet/year (the slower velocities are in the eastern portion of the OU where flow directions vary considerably).

The groundwater flow direction in the deeper zone in both eastern and western portions of the El Monte OU is consistently from east to west. The western trend is the result of deeper extraction west of the OU in Alhambra and Monterey Park. Gradients in the deep zone are similar to those listed above for the shallow zone. The hydraulic heads in the deeper aquifer are about 15 to 20 feet lower than those in the shallow aquifer. The groundwater flow velocity in the deeper zone is estimated at about 110 feet per year, which is generally higher than the estimates for the shallow zone.

Four multi-port monitoring wells were installed in the El Monte OU area during the RI. These multi-port wells have multiple, isolated screen intervals and provide information on water levels and water quality at different depths in the aquifer. Pronounced head differences are present at all four locations. The maximum difference in hydraulic heads between the shallowest and deepest intervals ranged from 20.65 feet to 33.34 feet. The associated downward vertical gradients ranged from 0.0836 to 0.1396 feet per feet.

The downward vertical gradients are the result of pumping in the deeper aquifer and resistance to vertical flow caused by the interbedded fine-grained strata in the aquifer. These large vertical gradients indicate that there is some degree of separation between the shallow and deep zones.

5.5 Groundwater Management

The El Monte OU is located in the Main San Gabriel Basin. The rights to pump groundwater from the San Gabriel Basin is adjudicated (i.e., assigned to specified users in accordance with a court judgment). There are two judgments that govern groundwater management in the El Monte OU vicinity.

5.5.1 San Gabriel Basin Judgment

Water rights in the Main San Gabriel Basin were adjudicated in a stipulated judgment by the Superior

Court of Los Angeles County in 1973 (amended in 1989). This adjudication resulted in assigning water

rights to approximately 50 parties that each hold rights to greater than one percent of the natural safe yield of the basin (152,700 acre-feet per year, established in the judgment), and approximately 100 parties that each hold rights to less than 1 percent of the natural safe yield. Also, according to the judgment, only selected parties have the right to export groundwater out of the Main San Gabriel Basin.

The judgment also establishes the duties of a Watermaster, which include annually determining an operating safe yield for the basin, monitoring pumpers' compliance with the judgment, issuing permits for all new and increased pumping in the basin, and preparing an annual report that includes details of pumping activities in the basin. The amount of groundwater that each water rights holder can pump in any year is adjusted by prorating the pumper's prescriptive rights (percentage of natural safe yield) by the operating safe yield, as established by the Watermaster.

The majority of the groundwater pumped from the Main San Gabriel Basin is used for drinking water, supplied to the public by purveyors that are regulated as public water supply systems. Annually, pumping typically equals or exceeds the operating safe yield of the basin. When excess extraction occurs, the judgment has established provisions for assessing pumpers the cost of importing replacement water to replenish the excess amount extracted. Replacement water is imported water purchased by the Upper San Gabriel Valley Municipal Water District and artificially recharged within the basin. The 1997-98 replacement water assessment is $246.65 per acre-foot.

5.5.2 Long Beach Judgment

The Long Beach Judgment is the 1964 settlement of a lawsuit between parties in the Central and San Gabriel Basins. This judgment mandates that an average of 98,415 acre-feet of useable water will be delivered to the Central Basin each year. This water consists of: (1) surface flow that passes through Whittier Narrows, (2) subsurface (groundwater) flow through Whittier Narrows, and (3) a portion of the water exported (piped) from the San Gabriel Basin to the Central Basin.

Although the Long Beach Judgment specifies an average entitlement of 98,415 acre-feet per year, the actual entitlement is calculated yearly by the court-appointed San Gabriel River Watermaster. The San Gabriel River Watermaster tabulates the water discharge through Whittier Narrows. If more than 98,415 acre-feet are delivered to the Central Basin from the San Gabriel Basin in a year, then the San Gabriel Basin is credited with the excess. Conversely, if less is delivered, the San Gabriel Basin is required to make up the difference either from past credits or, if that is not sufficient, through delivery of imported surface water as makeup water to the Central Basin.

5.6 Groundwater Contamination

VOCs are the primary organic contaminants found in groundwater above state and federal drinking water standards in the El Monte OU. PCE and TCE are the VOCs that have been detected most often in groundwater, although other VOCs, including 1,2-DCA, 1,1-DCA, cis-1,2-DCE, 1,1-DCE, and CCl_4 have also been detected above drinking water standards in the El Monte OU. In general, VOC concentrations are highest in the shallow groundwater in the vicinity of industrial facility source areas where releases have occurred. Figure 2 shows the extent of VOC contamination in the El Monte OU in the shallow zone. As shown in this figure, there are fairly large areas where VOC concentrations exceed 10 times the drinking water standards (or 50 μg/L) and isolated smaller areas where concentrations exceed 100 times drinking water standards (or 500 μg/L). In these areas, concentrations of PCE and TCE detected during the last round of sampling for the El Monte OU RI range from about 81 to 2,200 μg/L and 70 to 1,000 µg/L, respectively.

TCE and PCE concentrations in the deeper zone in the El Monte OU are much lower, generally less than

20 µg/L with a maximum of just over 50 µg/L. TCE is detected at higher concentrations than PCE in the deep zone. The extent of deep zone contamination is shown in Figure 3. Only one area had concentrations that exceeded 10 times the drinking water standards. Depth-specific samples collected from a production well indicated TCE exceedances down to 550 feet bgs, but in general the PCE and TCE exceedances in the deep zone occur above 350 feet bgs. In both the shallow and deep zones, VOC concentrations at the El Monte OU boundary are below drinking water standards. This indicates that at present groundwater contamination has not substantially migrated beyond the boundaries of the El Monte OU.

As described above, EPA has identified a number of industrial facilities in the El Monte OU as contaminant sources where releases have impacted groundwater quality. To address the industrial areas that contain these sources, the RWQCB, with funding from EPA, oversees site-specific investigations and cleanups.

Within the El Monte OU, EPA's RI efforts focused on regional groundwater contamination and EPA has not yet identified any specific areas of principal threat wastes. At some of the individual industrial facilities, where elevated concentrations of contaminants have been identified in the vadose zone and shallow groundwater, the RWQCB is overseeing facility-specific remedial actions. These focused actions should address the more highly-contaminated source areas.

6 Current and Potential Future Site and Resource Uses

6.1 Land Uses

Most of the El Monte OU is densely populated residential communities, with some commercial and light and heavy industrial areas. The area is essentially fully developed with very limited undeveloped or open areas. In the portions of the El Monte OU where the shallow groundwater contamination addressed in this ROD is found, land use is primarily light and heavy industrial. Residential areas are found adjacent to these industrial areas.

The El Monte OU is located in the cities of El Monte, Rosemead and Temple City. Eighty-three percent of the City of El Monte is zoned for residential use, seven percent is zoned for professional office purposes, five percent is zoned for industrial use, and five percent is zoned for commercial use. The city population was estimated at 136,938 in 1994. According to a demographic profile provided by the City of El Monte Planning Division, the population is expected to grow at a moderate rate during the late 1990s. The population in the City of Rosemead was estimated at 51,638 in 1990. The City of Rosemead is zoned primarily residential and commercial, with some light manufacturing. The population of Temple City was estimated at 32,000 in 1995. Temple City is zoned primarily residential, with some commercial and heavy industrial. Land use in the El Monte OU area is not expected to change significantly over time.

6.2 Groundwater Uses

The State of California has designated all portions of the San Gabriel Basin aquifer as either a current or potential source of drinking water. Currently, groundwater extracted in the vicinity of the El Monte OU is used as municipal water supply for residential, commercial and industrial purposes. As discussed previously, water rights in the Main San Gabriel Basin are fully adjudicated. Thus, the Main San Gabriel Basin Watermaster monitors all extraction. The producers that extract groundwater from within the El Monte OU are: California American Water Company, Clayton Manufacturing Company (industrial user), Crown City Plating Company (industrial user), City of El Monte, Driftwood Dairy (agricultural user), and Southern California Water Company. VOCs are detected in all production wells in the El Monte OU area. California American Water Company and the City of El Monte have had to shut down wells because of contamination and both the City of El Monte and Southern California Water Company have installed wellhead treatment systems to address VOC contamination in production wells.

Production from the shallow zone is limited as most of the production wells are perforated in the deeper zone. There are currently no drinking water supply wells that draw water from the shallow, highly contaminated zones in the vicinity of industrial facilities. Future groundwater use in the OU vicinity is expected to be similar to current use, with active extraction occurring in many portions of the OU. Future extraction will likely be primarily from the deeper zones.

7 Summary of Site Risks

EPA completed a Preliminary Baseline Risk Assessment (RA) for the El Monte OU in 1997 (EPA, 1997a). The baseline risk assessment estimates the human health and environmental risks that the site could pose if no action were taken. It is one of the factors that EPA considers in deciding whether to take action at a site. In the El Monte OU, EPA's decision to take action is based principally on the presence of contamination in groundwater at levels that exceed drinking water standards, evidence that contamination will continue to migrate into groundwater areas that are presently clean or less contaminated, and the current and potential use of groundwater in and around the El Monte OU as a source of drinking water. The risk assessment is also used to identify the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the Preliminary Baseline RA for the El Monte OU.

7.1 Summary of Human Health Risk Assessment

This summary of human health risk includes sections on the identification of chemicals of concern (COCs), exposure assessment, toxicity assessment, and risk characterization.

7.1.1 Identification of Chemicals of Concern

In the two-year period between January 1993 and January 1995, 25 VOCs were detected in groundwater from the El Monte OU area. Sampling data were available from 16 production wells and 52 site assessment monitoring wells during this period. All 25 VOCs were considered chemicals of potential concern (COPCs) for evaluation in the Preliminary Baseline RA. Of these 25 COPCs, only three contributed significantly to the estimated risks and are discussed as chemicals of concern (COCs) in this RA summary. Table 1 provides information on these COCs in each of two well groupings and three individual production wells considered in the RA.

As shown in Table 1, the three primary COCs found in groundwater in the El Monte OU were trichloroethylene (TCE), tetrachloroethylene (PCE), and carbon tetrachloride. All of the COCs are VOCs and all are present in the most contaminated portion of the shallow zone. Only two of the COCs, PCE and TCE, were also found in the deeper production wells. The table also shows that frequency of detection (i.e., the number of times the chemical was detected in the samples collected from each well grouping or production well during 1993 through 1995 groundwater sampling). The table indicates that PCE and TCE are the most frequently detected COCs in the El Monte OU and represent the extent of contamination in groundwater at the site shown in Figures 2 and 3.

Table 1 presents the exposure point concentration for each of the COCs detected in each of the well groupings and production wells evaluated. In all cases, the highest exposure point concentrations were from either TCE or PCE. The 95th percentile (95%) upper confidence limit (UCL) on the arithmetic mean concentration was used as the exposure point concentration for all of the COCs in the well groupings and production wells.

7.1.2 Exposure Assessment

Exposure refers to the potential contact on an individual (or receptor) with a chemical. Exposure assessment is the determination or estimation of the magnitude, frequency, duration, and route of potential exposure. This section briefly summarizes the potentially exposed populations, the exposure pathways evaluated, and the exposure quantification from the preliminary baseline RA performed for the El Monte OU.

Land use in the El Monte OU is primarily residential, commercial and industrial. There are nine active production wells in the El Monte OU. Of these, six are drinking water wells used for domestic purposes, one is an industrial well also used for drinking water, one is used for industrial purposes only and one is used for irrigation. Exposure to contaminants in groundwater could occur through the use of groundwater for domestic purposes, such as ingestion of tap water, inhalation of contaminants from water used for bathing, cooking and laundering, and dermal contact with the water. In the baseline RA, EPA evaluated two scenarios under which individuals might be exposed to contaminated groundwater:

1. Potential for a current resident to be exposed to contamination in groundwater through domestic use
2. Potential for a future resident to be exposed to contamination in groundwater through domestic use

It should be noted that the assumption that residents could be exposed to untreated groundwater from the well groupings or production wells evaluated is conservative. There are not currently any wells producing water for public drinking water supply from the highly contaminated shallow groundwater areas in the western or eastern portions of the El Monte OU. Further, regulations, such as the Safe Drinking Water Act, currently prohibit water purveyors from serving water contaminated in excess of drinking water standards to consumers. Based on potential for exposure frequency, duration, and estimated intake, residents exposed to contaminated groundwater used for domestic purposes are expected to be the maximally exposed population.

7.1.3 Toxicity Assessment

Table 1 shows the three COCs that are the major risk contributors for the El Monte OU. Based on data from various animal studies, all three of the compounds (carbon tetrachloride, PCE and TCE) are classified as probable human carcinogens (EPA weight of evidence class B2) and have the following oral carcinogenic slope factors (toxicity values) :

- Carbon Tetrachloride - 0.13 $(mg/kg/day)^{-1}$ (Source: Integrated Risk Information System (IRIS), EPA, 1995a).
- PCE - 0.052 $(mg/kg/day)^{-1}$ (Source: Environmental Criteria and Assessment Office, EPA, 1995b).
- TCE – 0.011 $(mg/kg/day)^{-1}$ (Source: Environmental Criteria and Assessment Office, EPA, 1995b).

All three of the above compounds are also considered carcinogenic through the inhalation route. Based on data from various animal studies, the inhalation carcinogenic slope factors are:

- Carbon Tetrachloride – 0.053 $(mg/kg/day)^{-1}$ (Source: Integrated Risk Information System (IRIS), EPA, 1995a).
- PCE – 0.002 $(mg/kg/day)^{-1}$ (Source: Environmental Criteria and Assessment Office, EPA, 1995b).
- TCE – 0.006 $(mg/kg/day)^{-1}$ (Source: Environmental Criteria and Assessment Office, EPA, 1995b).

The dermal route of exposure was incorporated into the preliminary baseline RA using an equation that incorporates the exposure point concentration and a dermal permeability constant (in centimeters/hour [cm/hr]). The dermal permeability constants for the three compounds are:

- Carbon Tetrachloride – 0.022 cm/hr.
- PCE – 0 .048 cm/hr.
- TCE – 0.016 cm/hr.

In addition to their classification as probable human carcinogens, the three compounds have toxicity data indicating their potential for adverse noncarcinogenic health effects in humans. The available toxicity data indicate that all three of the compounds primarily affect the liver. The chronic toxicity data available for these compounds have been used to develop oral reference doses (RfDs). An RfD represents a level that an individual may be exposed to that is not expected to cause any deleterious effect. The oral RfDs are:

- Carbon Tetrachloride – 0.0007 mg/kg/day (Source: Integrated Risk Information System (IRIS), EPA, 1995a).
- PCE – 0.01 mg/kg/day (Source: Integrated Risk Information System (IRIS), EPA, 1995a).
- TCE – 0.006 mg/kg/day (Source: Environmental Criteria and Assessment Office, EPA, 1995b).

Carbon tetrachloride is also considered to have noncarcinogenic effects via inhalation. The inhalation reference dose for carbon tetrachloride is 0.00057 milligrams per kilogram per day (mg/kg/day) (Source: Environmental Criteria and Assessment Office, EPA, 1995b).

7.1.4 Risk Characterization

This section presents the results of the evaluation of the potential risks to human health associated with exposure to contaminated groundwater in the El Monte OU. Exposure scenarios are evaluated by estimating the noncarcinogenic and carcinogenic risks associated with them.

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen. These risks are probabilities that usually are expressed in scientific notation (e.g., 1×10^{-6}). An excess lifetime cancer risk of 1×10^{-6} indicates that an individual has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. This is referred to as an "excess lifetime cancer risk" because it would be in addition to the risks of cancer individuals face from other causes such as smoking or exposure to too much sun. The chance of an individual developing cancer from all other causes has been estimated to be as high as one in three. EPA's generally acceptable risk range for site-related exposures is 10^{-4} to 10^{-6}. An excess lifetime cancer risk of greater than one in ten thousand (1×10^{-4}) is the point at which action is generally required at a site (EPA, 1991a).

The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a specified time period (e.g., a life-time) with a reference dose (RfD) derived for a similar exposure period. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ less than one indicates that a receptor's dose of a single contaminant is less than the RfD and that toxic noncarcinogenic effects from exposure to that chemical are unlikely. HQs for all COCs that affect the same target organ (e.g., liver) are added together to generate the Hazard Index (HI). An HI less than one indicates that noncarcinogenic effects from all the contaminants are unlikely. Conversely, an HI greater than one indicates that site-related exposures may present a risk to human health.

7.1.4.1 Conclusions

Tables 2 and 3 present the risk characterization summaries for carcinogenic and noncarcinogenic effects, respectively. The risk estimates presented in Tables 2 and 3 are based on average and reasonable maximum exposure (RME) and were developed by taking into account various conservative assumptions about the frequency and duration of exposure to groundwater, as wells as the toxicity of the primary COCs.

To assess potential current residential exposure to groundwater through domestic use, data from all active drinking water wells sampled from January 1993 through January 1995 that had positive detections of VOCs were used (wells 01900918, 01902948, and 08000101 on Tables 2 and 3). The cumulative estimated hazard index was less than one for the average exposure and RME scenarios (see the production wells on Table 3). The estimated excess lifetime cancer risk ranged from $1x10^{-8}$ to $9x10^{-8}$ for the average exposure scenario and $1x10^{-7}$ to $1x10^{-6}$ for the RME scenario (see the production wells on Table 2). The estimated excess lifetime cancer risks based on exposure to groundwater from the production wells that are currently active are less than the 10^{-4} to 10^{-6} acceptable risk range used by EPA to manage risks at Superfund sites. In addition, the estimated risks for these production wells are conservative because they do not take into account treatment of groundwater or the blending of groundwater from these wells with other production wells.

To assess potential future residential exposure to contamination in groundwater through domestic use, the preliminary RA focused on two areas within the OU that had groundwater concentrations exceeding 10 times the primary drinking water standards (i.e., MCLs). These two areas are represented by Well Group 1 (western El Monte OU) and Well Group 2 (eastern El Monte OU) on Tables 2 and 3. The two well groups consist primarily of shallow monitoring wells at or near industrial facilities and include those wells with the highest VOC concentrations in the OU area. The shallow intervals monitored by these wells are not currently used for drinking water supply. Use of these well groups to evaluate potential future risk is a conservative approach. The estimated hazard index ranged from 2 to 3 for the average residential exposure scenario and 6 to 10 for the RME residential scenario (see Well Groups 1 and 2 on Table 3). Major chemical contributors to the estimated hazard indices include carbon tetrachloride, PCE and TCE. The estimated excess lifetime cancer risk ranged from $7x10^{-5}$ to $2x10^{-4}$ for the average exposure scenario and $5x10^{-4}$ to $2x10^{-3}$ for the RME (see Well Groups 1 and 2 on Table 2). Major chemical contributors to the estimated excess lifetime cancer risk include PCE and TCE. The estimated hazard indexes and excess lifetime cancer risks based on potential future exposure to groundwater from Well Groups 1 and 2 exceed the acceptable risk range used by the EPA to manage risks at Superfund sites. Based on these estimated risks, the areas around Well Groups 1 and 2 should be considered for remediation.

The industrial/irrigation exposure to contamination in groundwater from production wells 01901055 and 01902924 was evaluated qualitatively in the preliminary RA. Concentrations of TCE in both wells exceeded the MCL, however, only limited data from these wells are available and neither well is used for drinking water purposes. The maximum concentration of VOCs in Wells 01901055 and 01902924 are well below the concentrations found in Well Groups 1 and 2. Therefore, worker risks from exposure to water from Wells 01901055 and 01902924 are expected to be less than those calculated for domestic use of Well Group 1 and 2 (described above). Further, in general, worker exposure is less than residential exposure.

Based on this risk characterization summary, actual or threatened releases of hazardous substances at this site, if not addressed by implementing the response action selected in this ROD, may present a potential threat to public health, welfare, or the environment. As described in the preceding paragraphs, the groundwater contamination does not represent a current threat to public health or welfare.

7.2 Summary of Ecological Risk Assessment

An evaluation was conducted as part of the El Monte OU Preliminary Baseline RA to determine whether there are any potential ecological exposure pathways in the El Monte OU. The potential for exposure to ecological receptors is related to the extent that groundwater contaminants migrate to or are discharged to surface water habitat. The environmental evaluation indicated that there are two plausible means for ecological receptors to be exposed to groundwater contaminants in the El Monte OU:

* Extraction and discharge of contaminated groundwater into surface water bodies containing ecological receptors.

* Natural discharge of contaminated groundwater into surface water bodies that contain ecological receptors.

The surface water bodies present in the El Monte OU area include the Rio Hondo (running northeast to southwest along the eastern boundary of the OU area) and Eaton Wash (running generally north to south in the western portion of the OU area). Both of these channels are concrete-lined in the OU area, limiting potential ecological habitat.

Outside of periodic, short-duration discharge associated with well testing activities, there is no known surface-water discharge of groundwater extracted in the El Monte OU. Based on the very limited frequency and duration of this RI-related type of discharge, no additional evaluation is warranted for this potential pathway.

The depth-to-water in the El Monte OU generally ranges between approximately 35 and 100 feet below ground surface. Given these groundwater depths, it is extremely unlikely that groundwater discharge to surface water would occur in the El Monte OU. EPA's Interim San Gabriel Basin RI Report (EPA, 1992a), confirms that natural discharge of groundwater to surface water (caused by shallow groundwater levels intersecting stream channel bottoms) is <u>not</u> expected in the Rio Hondo north of the Whittier Narrows area. Based on the depth-to-water in the El Monte OU, potential exposure pathways for aquatic and terrestrial organisms do not appear possible.

Based on this brief environmental evaluation, there do not appear to be any complete ecological exposure pathways in the El Monte OU.

7.3 Conclusion

In addition to the risk assessment, EPA has considered the state and federal drinking water standards (MCLs and MCLGs) that have been established for contaminants found in the El Monte OU. MCLs and MCLGs are set at levels, including an adequate margin of safety, where no known or anticipated adverse health effects are expected to occur. Even if the cumulative carcinogenic site risk to an individual based on reasonable maximum exposure is less than 10^{-4} and the non-carcinogenic hazard quotient is less than 1, remedial action will generally be warranted if MCLs or non-zero MCLGs are exceeded. "Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions," OSWER Directive 9355.0-30, April 22, 1991.

Contaminant concentrations exceed MCLs throughout a significant portion of the El Monte OU, including groundwater regions that are currently used as sources of drinking water. In some areas, contamination levels exceed 100 times MCLs. Based on the risk characterization, the presence of widespread contamination in excess of MCLs, the use of groundwater in the El Monte OU as a source of drinking water, and evidence that the contamination is migrating, EPA has determined that actual or threatened releases of hazardous substances at this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

8 Remediation Objectives

EPA's Remedial Action Objectives (RAOs) for the El Monte OU are to:

- Prevent exposure of the public to contaminated groundwater above MCLs;
- Inhibit contaminant migration from more highly contaminated portions of the aquifer to less contaminated areas or depths;
- Reduce the impact of continued contaminant migration on downgradient water supply wells, and;
- Protect future uses of less contaminated and uncontaminated areas.

These objectives reflect EPA's regulatory goal of restoring usable groundwater to its beneficial uses wherever practicable, within a time frame that is reasonable, or, if restoration is deemed impracticable, to prevent further migration of the plume, prevent exposure to the contaminated groundwater, and evaluate further risk reduction (40 C.F.R. Section 300.430[a][1][iii][F]). The RAOs address the risks associated with exposure to contaminated groundwater in the El Monte OU (described above in Section 7) by significantly limiting the potential for future exposure.

To meet the RAOs, migration control will be required in the El Monte OU as long as VOC concentrations in migrating groundwater exceed state or federal drinking water standards. The RAOs for the El Monte OU do not include numeric, chemical-specific objectives in the aquifer or a time frame for restoration because this is an interim action to contain contamination. Although this interim remedial action is not focused on mass removal, the proposed remedy will remove significant contaminant mass from the aquifer, in effect beginning the restoration process.

9 Description of Alternatives

EPA evaluated five alternatives in the FS for the El Monte OU:

- Alternative 1- No-Action
- Alternative 2- Groundwater Monitoring
- Alternative 3- Shallow Groundwater Control in Western El Monte OU
- Alternative 4- Shallow Groundwater Control in Western and Eastern El Monte OU
- Alternative 5- Shallow Groundwater Control in Western and Eastern El Monte OU Plus Deep Groundwater Control

A brief description of the five remedial alternatives is presented below.

9.1 Alternative 1 – No Action

The NCP requires EPA to consider a no action alternative and to evaluate the risk to the public if no action were taken. The No-Action Alternative provides a baseline for comparison with other remedial alternatives under consideration. In this alternative, no remedial actions are taken to control contaminant migration from or within the El Monte OU. This alternative does not include any groundwater monitoring, extraction, or treatment, so there is no cost associated with this alternative

The No-Action Alternative allows continued, uncontrolled migration of contamination. This alternative does not meet EPA's RAOs and does not comply with state and federal requirements.

9.2 Alternative 2 - Groundwater Monitoring

The only remedial action incorporated into Alternative 2 is groundwater monitoring to monitor VOC plume migration in the shallow and deep zones in the El Monte OU. Alternative 2 does not have any extraction, treatment, conveyance, or discharge components. This alternative would rely solely on passive mechanisms such as dilution or dispersion to address contaminant migration. This alternative also assumes that the groundwater management activities described in Section 5.5 continue to limit human exposure to groundwater contamination. This alternative includes implementing a monitoring program using new and existing wells to monitor contaminant migration and compliance with the El Monte OU remedial action objectives in the shallow and deep zones.

9.2.1 Monitoring

For cost estimation and evaluation of the alternative, installation of 9 new monitoring wells and semi-annual sampling of new and existing wells are assumed. These new wells would include 7 shallow wells and 2 multi-port wells.

9.3 Alternative 3 – Shallow Groundwater Control in Western El Monte OU

Alternative 3 includes the monitoring program from Alternative 2, plus shallow zone groundwater extraction and treatment components in the western portion of the El Monte OU to inhibit migration of contaminated groundwater. Alternative 3 does not include any active measures to address deep zone contamination. The system would be designed to contain shallow groundwater in the western portion of the OU that has VOC concentrations exceeding 10 times the primary drinking water standards (i.e., MCLs). The key components of the alternative are described below.

9.3.1 Extraction

The groundwater extraction in Alternative 3 would generally occur west of Temple City Boulevard (Figure 2). The shallow extraction would control migration of high-level contamination towards the west. This alternative would inhibit migration of contamination into downgradient shallow zones that are currently less contaminated or uncontaminated. Although the primary objective of the extraction wells is containment, to the extent possible, they would also be sited to maximize mass removal. The total extraction rate assumed for cost estimation purposes is 150 gallons per minute (gpm). The actual extraction well locations and rates would be determined during remedial design based on additional evaluation of the extent of contamination during the remedial design investigation.

9.3.2 Treatment

Either air stripping with off-gas treatment or liquid-phase carbon adsorption would be used to remove VOCs from the extracted groundwater prior to discharge. For cost estimation purposes, this alternative assumes a treatment system consisting of air stripping with carbon adsorption of VOCs in the off-gas. Other treatment processes could be evaluated during remedial design.

Treatment for nitrate and total dissolved solids (TDS) present in the shallow groundwater is not included in the cost estimates presented in Table 4. However, treatment for elevated nitrate and TDS may be necessary to meet requirements for discharge of the treated groundwater to surface water. For cost estimation purposes, a reverse osmosis process was assumed to treat elevated nitrate and TDS. If required, the addition of reverse osmosis treatment would increase total costs for Alternative 3 by about 25 percent.

9.3.3 Conveyance and Discharge

The assumed end use of the treated groundwater is discharge to Eaton Wash, although other options, such as reuse of the treated water in industrial processes or landscaping, may be evaluated. In the assumed scenario, the treated water would be conveyed from the treatment plant to Eaton Wash for discharge.

9.3.4 Monitoring

Alternative 3 includes a monitoring system to ensure compliance with RAOs and the performance criteria (discussed in Section 11) in the shallow zone in the Western El Monte OU. In addition, selected monitoring wells maybe used to provide an early warning system that would provide sufficient time to prevent noncompliance. Less contaminated groundwater not contained by the remedial action would be subject to natural attenuation processes as it migrates downgradient. The effectiveness of natural attenuation processes would be verified by groundwater sampling. For cost estimation and evaluation of the alternative, installation of 9 new monitoring wells and semi-annual sampling of new and existing wells are assumed. These new wells would include 7 shallow wells and 2 multi-port wells.

9.4 Alternative 4 – Shallow Groundwater Control in Western and Eastern El Monte OU

Alternative 4 includes all of the components of Alternative 3 described above, plus groundwater extraction and treatment in the shallow zone in the eastern portion of the El Monte OU to inhibit migration of contaminated groundwater. As in Alternative 3, Alternative 4 does not include any active measures to address deep zone contamination. This system would be designed to contain shallow groundwater in both the western and eastern portions of the OU that have VOC concentrations exceeding 10 times the primary drinking water standards (i.e., MCLs). The key components of the alternative are described below.

9.4.1 Extraction

The additional groundwater extraction in Alternative 4 would generally occur west of Arden Drive and north of Valley Boulevard (Figure 2). The additional extraction would be intended to control westerly and southerly migration of high-level shallow zone contamination that is located well to the east of the Alternative 3 extraction. This alternative would inhibit migration of contamination into downgradient shallow zones that are currently less contaminated or uncontaminated. Although the primary objective of the extraction wells is containment, they would also be sited to maximize the removal of contaminants from the groundwater. The additional extraction rate assumed for cost estimation purposes is 180 gpm. This would bring the total extraction rate to 330 gpm. The actual extraction well locations and rates would be determined during remedial design based on additional evaluation of the extent of contamination during the remedial design investigation.

9.4.2 Treatment

The treatment assumed for Alternative 4 is the same as that described above for Alternative 3. Separate treatment facilities would be located in the eastern portion of the OU under Alternative 4.

Treatment for nitrate and total dissolved solids (TDS) present in the shallow groundwater is not included in the cost estimates presented in Table 4. However, treatment for elevated nitrate and TDS may be necessary to meet requirements for discharge of the treated groundwater to surface water. For cost estimation purposes, a reverse osmosis process was assumed to treat elevated nitrate and TDS. If required, the addition of reverse osmosis treatment would increase total costs for Alternative 4 by about 35 percent.

9.4.3 Conveyance, Discharge and Monitoring

Assumptions for each of these components are the same as described above for Alternative 3.

9.5 Alternative 5 – Shallow Groundwater Control in Western and Eastern El Monte OU Plus Deep Groundwater Control

Alternative 5 includes all of the components described above for Alternative 4, plus groundwater control in two areas of deep zone contamination. One area of deep zone control is in the northwestern portion of the OU in the vicinity of the active Encinitas wellfield (Figure 3). The second area is in the southern

portion of the OU. Drinking water wells completed in the deep zone in both of these areas have been impacted by VOC contamination. The deep extraction would be designed to control migration of groundwater containing VOC contamination in excess of primary drinking water standards (MCLs). The key components of the alternative are described below.

9.5.1 Extraction

The additional groundwater extraction in Alternative 5 would generally occur in two separate locations. In the northern portion of the OU, the extraction would occur at, or in the vicinity of, the Encinitas wellfield (Figure 3). In the southern portion of the OU, extraction would be near the downgradient extent of contamination. The additional extraction would be intended to control deep zone contamination exceeding drinking water standards that is migrating northwest and west-southwest towards existing production wells beyond the OU boundaries. The total deep zone extraction rate assumed for cost estimation purposes is 1,325 gpm. This would bring the total extraction rate assumed for Alternative 5 (deep zone plus shallow zone) to 1,655 gpm. The actual extraction well locations and rates would be determined during remedial design based on additional evaluation of the extent of contamination during the remedial design investigation.

9.5.2 Treatment

Extracted water would be treated for VOC removal by either air stripping with off-gas treatment or liquid-phase carbon adsorption. For cost estimation purposes, this alternative assumes a treatment system consisting of air stripping with carbon adsorption of VOCs in the off-gas. Other treatment processes could be evaluated during remedial design.

Treatment for nitrate and total dissolved solids (TDS) would not likely be required for the deep groundwater because the deep water contains lower concentrations of these constituents

9.5.3 Conveyance and Discharge

The assumed end use option for the treated deep groundwater is delivery to a municipal water supply system. As in Alternatives 3 and 4, it is assumed that the treated shallow water would be discharged to Eaton Wash, although other options, such reuse of the treated water in industrial processes or landscaping, may be evaluated.

9.5.4 Monitoring

Alternative 5 includes a monitoring system to ensure compliance with RAOs and performance criteria in the shallow and deep zones in the El Monte OU. In addition, selected monitoring wells maybe used to provide an early warning system that would provide sufficient time to prevent noncompliance. Less contaminated groundwater not contained by the remedial action would be subject to natural attenuation processes as it migrates downgradient. The effectiveness of natural attenuation processes would be verified by groundwater sampling. For cost estimation and evaluation of the alternative, installation of 9 new monitoring wells and semi-annual sampling of new and existing wells are assumed. These new wells would include 7 shallow wells and 2 multi-port wells.

10 Comparative Analysis of Alternatives

The five remedial alternatives described in Section 9 are evaluated using the nine Superfund evaluation criteria listed in 40 C.F.R. Section 300.430. The comparative analysis provides the basis for determining which alternative presents the best balance of the criteria. The first two evaluation criteria are considered *threshold criteria* that the selected remedial action must meet. The five *primary balancing criteria* are balanced to achieve the best overall solution. The two *modifying criteria*, state and community acceptance, are also considered in remedy selection.

Threshold Criteria

- **Overall Protection of Human Health and the Environment** addresses whether each alternative provides adequate protection of human health and the environment, and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, and/or institutional controls.
- **Compliance with ARARs** addresses the requirement of Section 121(d) of CERCLA that remedial actions at least attain legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations, which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA Section 121(d)(4).

Primary Balancing Criteria

- **Long-term Effectiveness and Permanence** refers to the ability of a remedy to maintain reliable protection of human health and the environment over time.
- **Reduction of Toxicity, Mobility, or Volume Through Treatment** refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.
- **Short-term Effectiveness** addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers and the community during construction and operation of the remedy until cleanup goals are achieved.
- **Implementability** addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.
- **Cost** evaluates the estimated capital, operation and maintenance (O&M), and indirect costs of each alternative in comparison to other equally protective alternatives.

Modifying Criteria

- **State Acceptance** indicates whether the state agrees with, opposes, or has concerns about the preferred alternative.
- **Community Acceptance** includes determining which components of the alternatives interested persons in the community support, have reservations about, or oppose.

This section describes each threshold and primary balancing criterion, evaluates each alternative in relation to each criterion, and identifies advantages and disadvantages among the alternatives in relation to each criterion. Figure 4 presents a comparative matrix in which the five alternatives are ranked for each of the evaluation criterion. The details of how the rankings have been assigned for each criterion are provided below.

10.1 Overall Protection of Human Health and the Environment

The NCP requires that all alternatives be assessed to determine whether they can adequately protect human health and the environment from unacceptable risks from site contamination. These risks can be mitigated by eliminating, reducing, or controlling exposure to hazardous substances, pollutants, or contaminants.

10.1.1 Overall Protection of Human Health and the Environment: Evaluation of Alternatives

Alternatives 1 and 2 provide the least overall protection of human health and the environment. Neither alternative has an active remedy component that provides migration control or containment of the contaminated groundwater. Only the existing groundwater management activities discussed in Section 5.5 would be available to control public exposure to the contaminated groundwater. Limitations of Alternative 1 include increased long-term potential for human exposure; leaving the burden of constructing treatment facilities to water purveyors; and increased cost, difficulty, and time required for containment. As long as existing government controls remain in effect, there should be no increase in long-term potential for human exposure with Alternative 2. The burden and cost of constructing treatment facilities, if required, would be borne by the water purveyors. Alternative 2 includes groundwater monitoring that would provide early warning of increases in contaminant concentrations at downgradient drinking water sources. An advantage of Alternatives 1 and 2 is that there are no risks associated with treatment residuals because none are created.

Alternatives 3 through 5 would reduce long-term risks to human health and the environment by containing contaminated groundwater and preventing migration from more highly contaminated areas to less contaminated areas. However, Alternatives 3 and 4 are not considered fully protective because they do not address deep zone contamination. Portions of the deep zone are currently in use as a drinking water supply. The treatment technologies employed by these alternatives are effective at meeting federal and state MCLs. Alternative 4 is ranked higher than Alternative 3 because it includes additional shallow extraction and discrete containment in the eastern portion of the El Monte OU. Alternative 4 extraction also provides additional mass removal in the eastern portion of the OU. Alternative 5 is ranked higher than Alternatives 3 and 4 because it addresses both shallow and deep groundwater contamination in the El Monte OU.

10.2 Compliance with ARARs

This evaluation criterion is also a threshold requirement and is used to determine if each alternative would attain federal and state ARARs, or whether there is adequate justification for invoking waivers for specific ARARs.

10.2.1 Compliance with ARARs: Evaluation of Alternatives

Alternatives 1 and 2 do not meet ARARs. Both alternatives allow for continued migration of contaminants above MCLs into less contaminated and uncontaminated portions of the groundwater.

Alternatives 3 through 5 were designed to meet the ARARs described in Section 12 of this ROD. These alternatives provide containment as well as protection of existing production wells and significant portions of the aquifer that are currently less contaminated or uncontaminated. The recent discovery of deep groundwater contamination at the Encinitas Well Field, however, indicates that Alternatives 3 and 4 may not meet drinking water ARARs for the deep groundwater zone. Alternative 5 is ranked higher than Alternatives 3 and 4 because it addresses both shallow and deep groundwater contamination.

10.3 Long-Term Effectiveness

This evaluation criterion assesses the extent to which each remedial alternative reduces risk after the remedial action objectives are met. Residual risk can result from exposure to untreated waste or treatment residuals. The magnitude of the risk depends on the magnitude of the wastes and the adequacy and reliability of controls, if any, that are used to manage untreated waste and treatment residuals. For this interim action, untreated waste refers to any contaminated groundwater not removed from the aquifer.

The performance of the alternatives in relation to this criterion is evaluated primarily by estimating the extent to which each alternative prevents the migration of contamination into less contaminated and uncontaminated areas. Preventing or reducing contaminant migration reduces contaminant concentrations in downgradient areas, reducing risk by reducing the likelihood of exposure. Because this is an interim remedy to contain contaminant migration, untreated wastes will remain in the groundwater.

10.3.1 Long-Term Effectiveness and Permanence: Evaluation of Alternatives

Alternatives 1 and 2 are ranked low for this criterion because neither alternative has an active remedy component that provides migration control or containment of the contaminated groundwater. Contaminated groundwater would continue to migrate downgradient. Although natural attenuation processes (adsorption, dilution, dispersion) would likely decrease the concentration of contaminants in the plumes, downgradient water supply wells would be vulnerable to VOC contamination. Alternatives 1 and 2 would not generate any treatment residuals.

Alternatives 3 through 5 provide containment and treatment of contaminated groundwater as indicated by groundwater modeling. Alternatives 3 and 4 are assigned a lower ranking than Alternative 5 because they only address the shallow groundwater contamination and provide containment at 10 times drinking water standards. Alternative 5 addresses both the shallow and deep contamination and provides containment of water above drinking water standards in the deep zone. Less contaminated groundwater not contained by the remedial actions in Alternatives 3 through 5 would be subject to natural attenuation processes as it migrates downgradient. The effectiveness of natural attenuation processes would be verified by groundwater sampling.

In Alternatives 3 through 5 the residual generated from treatment of contaminated groundwater would be spent granular activated carbon. This spent granular activated carbon would be reactivated offsite. The transportation and reactivation of this residual would be conducted in accordance with applicable regulations and would present minimal long-term risks because contaminants adsorbed to the granular activated carbon would be destroyed during the reactivation process.

10.4 Reduction of Toxicity, Mobility, and Volume Through Treatment

This criterion addresses the preference, as stated in the NCP, for selecting remedial actions employing treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances as a principal element of the action. This preference is satisfied when treatment is used to reduce the principal threats at a site through destruction of toxic contaminants, reduction of total mass of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media.

This evaluation focuses on the following factors for each remedial alternative:

- Whether the alternative satisfies the statutory preference for treatment as a principal element
- The treatment process employed, including the amount of hazardous materials that will be destroyed or treated and the degree of expected reduction in toxicity, mobility, or volume
- The degree to which treatment is irreversible
- The type and quantity of treatment residuals that will remain following treatment

10.4.1 Reduction of Toxicity, Mobility, or Volume Through Treatment: Evaluation of Alternatives

Alternatives 1 and 2 do not provide any increased reduction in toxicity, mobility, or volume over existing conditions and do not satisfy the statutory preference for treatment. Alternatives 3 through 5 satisfy the statutory preference for treatment. These alternatives would significantly reduce the volume and mobility of contamination by inhibiting further contaminant migration. The treatment technologies considered for Alternatives 3 through 4, air stripping with off-gas controls and liquid-phase carbon adsorption, would irreversibly reduce the toxicity and volume of contaminants in the extracted groundwater and result in an effluent stream that meets drinking water standards for VOCs. Both treatment technologies would result in the destruction of VOCs when the granular activated carbon is regenerated.

Alternative 3 would provide removal of an estimated 21,400 pounds of VOCs over a 30-year period of operation, while Alternative 4 would provide removal of an estimated 40,000 pounds. Alternative 5 provides the highest amount of mass removal with an estimated 45,900 pounds of VOCs removed. Although the VOC mass removed by Alternative 5 is larger than the VOC mass removed by Alternatives 3 and 4, a substantially greater amount of water must be pumped for a relatively small increase in VOC mass removed. The extraction rate for Alternative 5 is approximately 5 times that of Alternative 4, while the VOC mass removed is only about 15 percent greater. It should be noted that these VOC mass removal estimates are very approximate and actual operation of the extraction and treatment systems in Alternatives 3 through 5 could yield lower or higher values.

10.5 Short-Term Effectiveness

This criterion evaluates the effects of each remedial alternative on human health and the environment during the construction and implementation phase until remedial action objectives are met. The following factors are addressed for each alternative:

- **Protection of workers and the community during construction and implementation phases.**

This factor qualitatively examines risk that results from implementation of the proposed remedial action and the effectiveness and reliability of protective measures.

- **Environmental impacts.** This factor addresses the potential adverse environmental impacts that may result from the construction and implementation of an alternative. This factor also evaluates the reliability of the available mitigation measures to prevent or reduce potential impacts.
- **Time until RAOs are achieved.**

10.5.1 Short-Term Effectiveness: Evaluation of Alternatives

Alternative 1 is not evaluated for this criterion because there is no construction or implementation phase and RAOs would not be met. None of the alternatives pose unmitigable risks to the community during construction and implementation. Nor do any of the alternatives pose unmitigable risks to workers beyond general construction hazards associated with large construction projects. No unmitigable negative environmental impacts are anticipated in the areas in which facilities would be constructed.

For Alternative 2, the RAOs would not be met as long as contaminant migration continues, which would likely be a considerable length of time. For Alternatives 3 through 5, containment of contaminated groundwater would be achieved within a few days of system startup. However, Alternatives 3 and 4 do not provide containment in all contaminated areas. Alternative 3 would meet the RAOs in the shallow zone in the western portion of the El Monte OU. Alternative 4 would meet the RAOs in both the western and eastern portions of the shallow zone, but would not achieve RAOs in the deep zone. Alternative 5 is the only alternative that would meet the RAOs in both the shallow and deep zones. Alternative 5 may take slightly longer to meet RAOs because of the additional construction required.

10.6 Implementability

This criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation. The following factors are considered:

- Technical Feasibility
  - Ability to construct and operate: addresses any technical difficulties and unknowns associated with construction or operation of the technology
  - Reliability of technology: focuses on the likelihood that technical problems associated with implementation will lead to schedule delays
  - Ease of undertaking additional remedial action: includes a discussion of what, if any, future remedial actions may need to be undertaken and how the remedial action would interfere with, or facilitate, the implementation of future actions
- Administrative Feasibility
  - Coordination with other agencies, including the need for agreements with parties other than EPA required for construction and operation of the remedy.
- Availability of Services and Materials
  - Availability of necessary equipment, specialists, and provisions to assure any necessary resources
  - Availability of services and materials, plus the potential for obtaining competitive bids

10.6.1 Implementability: Evaluation of Alternatives

Alternative 1 is not evaluated for this criterion because no action is implemented. As described above, the implementability evaluation incorporates several factors. Each of these is discussed separately in the following text.

Technical Feasibility: Ability to Construct and Operate. The extraction, treatment, and conveyance technologies included in Alternatives 3 through 5 and the monitoring technologies included in Alternatives 2 through 5 are widely used. No significant difficulties are expected in construction and operation of these technologies.

Technical Feasibility: Reliability of Technology. The extraction, treatment, conveyance, and monitoring technologies in Alternatives 2 through 5 are generally known to be proven and reliable.

Technical Feasibility: Ease of Undertaking Additional Remedial Actions. The alternatives would not interfere with the implementation of future response actions to further contain contamination or restore groundwater in the El Monte OU area.

Administrative Feasibility. There are not likely to be any significant administrative feasibility issues associated with implementation of Alternative 2, other than obtaining access agreements for monitoring well installation. Implementation of Alternatives 3 through 5 would require acquisition of property and/or easements for the construction of extraction wells, treatment facilities, and conveyance facilities. In addition, implementing Alternatives 3 through 5 would require resolution of the following administrative issues associated with groundwater extraction and discharge of treated water to local water purveyors or to Eaton Wash:

- Agreements may need to be made with the Watermaster or with a water purveyor to account for extraction from the basin by the parties implementing the selected remedy because these parties may not have water rights.
- An agreement with the Watermaster may be required regarding the potential need to pay replenishment fees for treated water discharged to Eaton Wash.
- Agreements would need to be reached with water purveyors that would receive treated water from the groundwater treatment facilities specifying the amount of water each purveyor would accept; the treated water delivery location; responsibility for any necessary capital improvements to purveyor systems; and to determine operational, liability, financial, and other arrangements.
- Water purveyors would need to obtain approval for modifications to their water supply permits.
- If treated water is discharged to Eaton Wash, RWQCB Basin Plan water quality objectives for Eaton Wash would need to be met. If the discharge exceeds Basin Plan inorganic water quality objectives, it may be necessary to conduct an evaluation of the impact of the discharge on downgradient surface water and groundwater, as well as an evaluation of reuse alternatives for the VOC-treated groundwater. If water quality impacts are minimal and reuse alternatives infeasible, the discharge may be allowed. If the water quality impacts are unacceptable and no other method of disposal is identified, a treatment system for the inorganics would need to be included as part of the remedial action. Reverse osmosis treatment is one such system that is generally known to be proven and reliable.

Availability of Services and Materials. Implementation of Alternatives 3 through 5 would require fabrication of treatment plant equipment. Required services and materials are believed to be available, including qualified contractors for construction and operation of the necessary facilities.

Alternative 2 is assigned a higher ranking in Figure 4 because there are no significant issues that could impact implementability of this monitoring-only alternative. Alternatives 3, 4 and 5 are ranked lower because of the administrative issues associated with groundwater extraction and treated water discharge. Alternatives 4 and 5 require construction of additional facilities that could lead to more construction/schedule delays.

10.7 Cost

This criterion addresses the total cost of each alternative. This includes short- and long-term costs, and capital and O&M costs. The following cost elements are considered for each alternative:

- **Capital Cost.** Direct capital cost includes the cost of construction, labor, equipment, land, site development, and service. Indirect capital cost includes engineering fees, license and permit cost, startup and shakedown costs, and contingencies.
- **O&M Cost.** Annual O&M cost includes operating labor cost, maintenance materials and labor, pumping and treatment energy costs, monitoring costs, and all other post-construction costs necessary to ensure continuous effective operation of the alternative.
- **Total Present Worth.** The total present worth of each alternative is calculated at a discount rate of 5 percent and a time period of 30 years. Total present worth for each alternative includes capital cost plus the present worth of the annual O&M costs.

The cost estimates are considered order-of-magnitude level estimates (i.e., the cost estimates have an expected accuracy of +50 to -30 percent). The assumption of a 30-year operating period is based on EPA guidance and does not reflect any specific finding regarding the duration of the selected remedy.

10.7.1 Cost: Evaluation of Alternatives

Although there is no cost presented for the no-action alternative (Alternative 1), there have been and would continue to be substantial financial impacts on local water purveyors or their rate payers because of the continued migration of contamination to their production wells. Table 4 summarizes the estimated costs for Alternatives 2 through 5, respectively.

10.7.2 Cost: Comparison of Alternatives

Table 4 compares the cost of each alternative for capital costs, long-term O&M costs, and present worth. The short-term capital costs range from $1,250,000 for Alternative 2 to $7,930,000 for Alternative 5. The annual O&M costs range from $200,000 for Alternative 2 to $960,000 for Alternative 5.

10.8 State Acceptance

The State of California has provided comments and feedback to EPA throughout the RI/FS process for the El Monte OU. In a letter dated April 12, 1999, the California Department of Toxic Substance Control (DTSC), as lead agency for the state, concurred with EPA's selected remedy. In addition, the RWQCB concurred with EPA's selected remedy in a letter dated March 10, 1999.

10.9 Community Acceptance

EPA received written comments from one individual and two organizations on the Proposed Plan for this interim action in the El Monte OU. In addition, EPA received limited oral comments and questions at the public meeting held in November 1998 to discuss EPA's plans. EPA responded directly to the oral questions at the public meeting. All of the written comments received during the 60-day public comment period , along with EPA's responses to them, are presented in the Responsiveness Summary in Part III of this ROD. The transcript for the public meeting is available at EPA's Superfund Records Center at EPA's Regional Office in San Francisco, and locally at two information repositories: the West Covina Library and the Rosemead Library.

One commenter did not believe that the information collected and evaluations performed to date provided sufficient justification to demonstrate that the remedy selected (Alternative 5) was necessary. This commenter requested that EPA perform additional evaluations and incorporate these into the remedy selection process. EPA has determined that sufficient data have been collected and evaluated to conclude that the preferred alternative presented in the Proposed Plan represents the most appropriate interim remedy for the El Monte OU. None of the comments received warranted a change to the overall remedy that EPA selected.

11 Selected Remedy

After considering CERCLA's statutory requirements, the detailed comparison of the alternatives using the nine evaluation criteria, and public comments, EPA, in consultation with the State of California, has determined that the most appropriate remedy for this site is **Alternative 5: shallow groundwater control in western and eastern El Monte OU plus deep groundwater control.** Alternatives 1 and 2 provide the least overall protection of human health and the environment and do not comply with ARARs. Alternative 3 addresses only a portion of the shallow zone in the El Monte OU. Although Alternative 4 adequately addresses all of the shallow contamination in the OU, it does not include remedial actions that provide containment of the deep zone contamination. Deep zone contamination has impacted several production wells in the El Monte OU and EPA believes that controlling further contaminant migration in the deep zone is critical. Because it addresses contaminant migration in both the shallow and the deep zone, Alternative 5 is the only alternative that meets EPA's remedial action objectives in both the shallow and deep zones and satisfactorily meets the threshold criteria of overall protection of human health and the environment and compliance with ARARs. Although Alternative 5 costs more than the other alternatives, the additional benefits provided from the deep zone containment far outweigh the additional cost. Overall, Alternative 5 provides the best balance in tradeoffs between the evaluation criteria. EPA expects that this interim remedy will provide the basis for the final remedy for the El Monte OU.

11.1 Description of the Selected Remedy

The selected remedy will be implemented using a performance-based approach. The performance-based approach specifies criteria ("performance criteria") that must be met while allowing flexibility in implementation. The performance criteria are designed to attain the RAOs for the El Monte OU and are described below. These performance criteria have been refined since they were first presented in the proposed plan for the El Monte OU.

11.1.1 Performance Criteria

Performance Criterion for the Shallow Zone:

The remedial action shall prevent groundwater in the shallow zone with VOC contamination above 10 times the ARARs listed in Table 5 from migrating beyond its current lateral and vertical extent.

Compliance with this criterion will be monitored at wells described as follows:

- Located laterally and vertically downgradient of shallow groundwater contamination exceeding 10 times the relevant ARAR, but generally within areas where VOC concentrations exceed the ARARs listed in Table 5.
- Completed with screen lengths generally of 20 feet or less between the water table and 130 feet bgs. Longer screened intervals may be appropriate in limited situations and will be evaluated on a case-

by-case basis

Extracted groundwater will be treated by air stripping (with off-gas controls) or liquid-phase carbon adsorption. If alternative treatment technologies are identified, EPA will evaluate the alternative technologies in accordance with the criteria specified in 40 C.F.R. Section 300.430 during remedial design.

Performance Criterion for the Deep Zone, Northwestern Area

The remedial action shall provide sufficient hydraulic control to prevent deep zone groundwater with VOC contamination above the ARARs listed in Table 5 from migrating into or beyond the Encinitas Well Field Area (described in Section 11.1.3.2) in the northwestern portion of the OU.

Compliance with this criterion will be monitored at compliance wells described as follows:

- Located within 2,000 feet of a production well in the Encinitas Well Field.
- Located generally west to northwest of the current extent of deep zone groundwater contamination, within the area with detectable VOC concentrations in the deep zone.
- Completed with screen lengths of 20 feet or less within the deep zone. Larger screened intervals may be appropriate in limited situations and will be evaluated on a case-by-case basis.

Performance Criterion for the Deep Zone, Southern Area

The remedial action shall apply measures necessary to prevent deep zone groundwater with VOC contamination above the ARARs listed in Table 5 from migrating beyond its current lateral and vertical extent, as described in the RI/FS for the El Monte OU, in the southern portion of the OU.

Compliance with this criterion will be monitored at compliance wells described as follows:

- Located within 2,000 feet of the current extent of groundwater contaminated with any VOC exceeding its ARAR. Because the downgradient extent of deep zone contamination in the southern area is not well defined, additional data collection during remedial design may be necessary in this area.
- Located generally west to southwest of the current extent of deep zone groundwater contamination, within the area with detectable VOC concentrations in the deep zone
- Completed with screen lengths of 20 feet or less within the deep zone. Larger screened intervals may be appropriate in limited situations and will be evaluated on a case-by-case basis

Extracted deep zone groundwater will be treated by air stripping (with off-gas controls) or liquid-phase carbon adsorption. If alternative treatment technologies are identified, EPA will evaluate the alternative in accordance with the criteria specified in 40 C.F.R. Section 300.430 during remedial design.

Implementation of the remedial action cannot result in any adverse effects (i.e., increases in migration of contamination) to production wells that are not part of the remedial action. In addition, the remedial action must provide adequate capture of contamination above ARARs without relying on the effects of wells that are not part of the remedial action.

11.1.2 Compliance with Performance Criteria

Compliance with the performance criteria will be confirmed by quarterly sampling at compliance wells. Over time, if it can be demonstrated, based on historical monitoring data, that concentrations are unlikely to exceed the performance criteria in the short term, monitoring intervals may be lengthened. If it appears, based on trends in monitoring data, that concentrations may exceed the performance criteria, monitoring intervals may be shortened.

Concentrations at compliance wells will be used as an absolute criterion to demonstrate compliance. EPA expects that groundwater containment actions will be implemented sufficiently upgradient of these wells to provide enough of a buffer zone to allow additional actions to be taken, if necessary, to ensure compliance. EPA also anticipates that additional monitoring wells will be installed, or existing wells within this buffer zone will be used to provide an early warning system, and therefore provide sufficient time to address and prevent noncompliance.

Imminent exceedance of the performance criteria at compliance wells indicates that groundwater contamination is migrating, and hydraulic containment is required. Any actual or imminent exceedance of the performance criteria at the compliance wells will require groundwater extraction and treatment to achieve hydraulic containment. Actual exceedance of performance criteria at compliance wells will result in the initiation of enforcement actions.

11.1.3 Supplemental Explanation of Performance Criteria

The following paragraphs provide additional explanation of the performance criteria, their meaning and objectives to help clarify the intent of the criteria.

11.1.3.1 The "Shallow" and "Deep" Zones

The shallow zone generally encompasses the upper 100 feet of the saturated aquifer, including the interval between the water table and approximately 150 feet below ground surface. The deep zone generally includes the somewhat coarser-grained interval beneath the shallow zone that is used for groundwater production. Both terms are used in a manner consistent with their usage in the El Monte OU Final Remedial Investigation and Feasibility Study Reports (CDM, 1998a and 1998b, respectively).

The "shallow" and "deep" zones are terms intended to describe general horizons within the aquifer(s) underlying the El Monte OU. During the course of the RI and development of the FS, the complex stratigraphy was simplified with generalizing assumptions about vertical intervals that appear to have similar characteristics throughout the area. However, actual subsurface conditions are not accurately described by terms that imply a well-layered system. The alluvial materials that underlie the El Monte OU are very heterogeneous, and are made up of interfingering lenses of variable hydraulic properties.

The shallow zone represents the upper portion of the saturated sediments at and under the water table. Contaminant concentrations, transport rates and groundwater flow directions in the shallow zone vary considerably across the El Monte OU. Remediation of migrating contamination in the shallow zone requires careful analysis of this variability and an adequate understanding of the extent, nature, and sources of contamination.

The deep zone incorporates the entire portion of the aquifer beneath the shallow zone. In the context of this remedy, the deep zone extends to the deepest depths where groundwater exceeds ARARs standards. In general, this is the upper 400 feet below ground surface. However, depth-specific sampling indicates that isolated occurrences of deeper ARARs exceedances are possible. Contamination appears to travel faster within the deep zone because of the coarser sediments and associated higher hydraulic conductivity values. Numerous drinking water production wells extract water from the deep zone in the El Monte OU vicinity. Containing contaminant migration within the deep zone is considered essential to avoiding further adverse impacts to downgradient drinking water wells in the future.

11.1.3.2 Encinitas Well Field Area

The Encinitas Well Field contains production wells owned by Southern California Water Company. The current extent of deep zone groundwater contamination extends into the Encinitas Well Field. EPA's objective in this portion of the deep zone is to ensure that contamination does not migrate beyond the Encinitas Well Field Area. For the purposes of this remedial action, the Encinitas Well Field Area is defined as: (1) the three Southern California Water Company Encinitas wells (wells 01902024, 10902035, and 08000073) and (2) the downgradient extent of contamination above ARARs in the vicinity of these wells. The intent of defining the zone in this manner is to provide an adequate basis for designing a remedial action that does not allow contamination to spread away from its current extent.

The Encinitas Well Field Area is considered to be a generally elliptical or circular area that encompasses both the Encinitas wells and any downgradient extent of contamination.

There are two approaches that should be able to accomplish the deep zone objectives in the Encinitas Well Field Area. The first relies exclusively on installation of new extraction wells upgradient of the production wells. These new wells must provide sufficient hydraulic control to capture contamination migrating into the production field. The second approach incorporates the production wells into the remedial action. If this approach is used, it must be demonstrated that pumping from the production wells alone, or in combination with new wells, provides sufficient hydraulic control. For the production wells to be considered part of the remedial action, the responsible parties will have to provide acceptable assurances to EPA that the wells will operate in a manner that ensures compliance with the performance criteria. If other approaches for achieving containment are identified, EPA will evaluate those methods in accordance with the criteria specified in 40 C.F.R. Section 300.430.

For any remedial approach, compliance will be monitored at wells located downgradient of the Encinitas Well Field Area. If a new extraction system is used, monitoring wells must also be placed to measure the effectiveness of the system at preventing migration of contaminants into the Encinitas Well Field Area. The remedial action must, by itself, provide sufficient capture and be monitored to ensure that the performance criteria are not exceeded.

11.1.3.3 Compliance Wells

Compliance wells in the shallow zone will be located to ensure adequate monitoring of contaminant migration both laterally and vertically. Wells must provide sufficient information to assess whether the remedial action is preventing further migration of contaminants. The number, location, and monitoring of these wells must ensure that contamination is not spreading laterally away from areas that are already contaminated, or vertically into deeper zones.

The NEMCTF is currently conducting an "Early Response Action Program" (ERAP) that includes the installation of 7 shallow monitoring wells along the edges of the shallow groundwater plumes. Data collected from this program will be used together with data collected during the RI to determine the current lateral and vertical extent of shallow groundwater contamination.

Compliance wells in the deep zone, southern portion of the OU, must be located within 2,000 feet of the area with groundwater contamination exceeding ARARs or, in the northwestern portion of the OU, within 2000 feet of the Encinitas Well Field Area, yet within areas of detectable contamination, as described in the performance criteria, and further described below. The intent of locating these wells in this manner is to provide compliance points that are sufficiently distant from existing contamination above ARARs to provide enough time to ensure that additional actions can be taken before threshold concentrations are exceeded. The wells must also be sufficient in number and adequately located to ensure that contamination above ARARs does not migrate away from the Encinitas Well Field Area or the current extent of contamination in the southern area. As described above, the downgradient extent of contamination in the southern deep zone has not been fully characterized. The downgradient extent of contamination will be more fully characterized using data from up to two ERAP multi- port wells in the southern area of the El Monte OU.

Locations of all compliance wells are subject to EPA approval. Well screens will generally be of 20 feet or less. Concentrations in wells vary as a function of screen length because of blending. Therefore, wells with screens longer than 20 feet are not generally considered appropriate for monitoring compliance. However, based on conditions encountered during installation of these wells, it may be appropriate to consider longer screens to ensure monitoring of several high-permeability zones. Installation of wells with screens exceeding 20 feet will be considered on a case-by-case basis subject to EPA approval.

11.1.3.4 Adverse Effects

The term "adverse effects" is included in the performance criteria to prevent the design and installation of a hydraulic control system that maintains concentrations at compliance wells below specified thresholds at the expense of production wells that are not part of the remedy. The principal adverse effect of concern is implementation of the remedial action in a manner that results in increased contaminant concentrations in wells that are not part of the remedial action. This requirement prevents, for example, the installation of new extraction wells immediately upgradient of the compliance wells and downgradient of production wells that are not part of the remedial action. The remedial action must be protective of the environment and not result in adverse effects, either on production wells, or on the overall extent of contamination.

11.2 Summary of the Estimated Remedy Costs

A detailed breakdown of the estimated capital, operating and maintenance (O&M), and present worth costs associated with the selected remedy is included in Table 6. The present worth costs assume a 5% discount rate and a 30 year project duration. These cost estimates are expected to be accurate within +50 to –30%. The total estimated capital costs are $7.93 million. The estimated annual O&M costs are $0.96 million and the total present worth cost estimate is $22.67 million.

11.3 Expected Outcomes of the Selected Remedy

Once implemented, this interim remedy will protect the existing beneficial uses of the currently uncontaminated aquifer downgradient of the compliance wells. The remedy will allow for continued use of these areas, particularly the deep zone, as a source of drinking water supply.

Because the interim remedial action selected in this ROD is for containment and not restoration, no final cleanup standards have been established for restoration of groundwater. This means that at least a portion of the shallow and deep zones upgradient of the compliance wells and any associated extraction systems will likely remain contaminated and unusable for a considerable length of time.

12 Applicable or Relevant and Appropriate Requirements (ARARs)

Section 121(d) of CERCLA, 42 U.S.C. § 9621(d) requires that remedial actions at CERCLA sites attain (or justify the waiver of) any federal or state environmental standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate. These applicable or relevant and appropriate requirements are referred to as "ARARs." Federal ARARs may include requirements promulgated under any federal environmental laws. State ARARs may only include promulgated, enforceable environmental or facility-siting laws of general application that are more stringent or broader in scope than federal requirements and that are identified by the state in a timely manner.

An ARAR may be either "applicable," or "relevant and appropriate," but not both. If there is no specific federal or state ARAR for a particular chemical or remedial action, or if the existing ARARs are not considered sufficiently protective, then other guidance or criteria to be considered (TBCs) may be identified and used to ensure the protection of public health and the environment. The NCP, 40 C.F.R. Part 300, defines "applicable," "relevant and appropriate," and "to be considered" as follows:

- **Applicable requirements** are those cleanup standards, standards of control, or other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable.
- **Relevant and appropriate requirements** are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are identified in a timely manner and that are more stringent than federal requirements may be relevant and appropriate.
- **TBCs** consist of advisories, criteria, or guidance that EPA, other federal agencies, or states developed that may be useful in developing CERCLA remedies. The TBC values and guidelines may be used as EPA deems appropriate.

ARARs are identified on a site-specific basis from information about the chemicals at the site, the remedial actions contemplated, the physical characteristics of the site, and other appropriate factors. ARARs include only substantive, not administrative, requirements, and pertain only to onsite activities. Offsite activities must comply with all applicable federal, state, and local laws, including both substantive and administrative requirements, that are in effect when the activity takes place. There are three general categories of ARARs:

- **Chemical-specific** ARARs are health- or risk-based concentration limits, numerical values, or methodologies for various environmental media (i.e., groundwater, surface water, air, and soil) that are established for a specific chemical that may be present in a specific media at the site, or that may be discharged to the site during remedial activities. These ARARs set limits on concentrations of specific hazardous substances, pollutants, and contaminants in the environment. Examples of this type of ARAR include state and federal drinking water standards.
- **Location-specific** ARARs set restrictions on certain types of activities based on site characteristics. Federal and state location-specific ARARs are restrictions placed on the concentration of a contaminant or the activities to be conducted because they are in a specific location. Examples of special locations possibly requiring ARARs may include floodplains, wetlands, historic places, and sensitive ecosystems or habitats.
- **Action-specific** ARARs are technology- or activity-based requirements that are triggered by the type of remedial activities under consideration. Examples of this type of ARAR are RCRA regulations for waste treatment, storage, or disposal.

EPA has evaluated and identified the ARARs for the selected remedy in accordance with CERCLA, the NCP, and EPA guidance, including the *CERCLA Compliance with Other Laws Manual, Part I (Interim Final),* OSWER Directive 9234.1-01 (EPA, 1988a) and *CERCLA Compliance with Other Laws Manual, Part II,* OSWER Directive 9234.1-02 (EPA, 1989).

12.1 Chemical-specific ARARs

The chemicals of potential concern for the El Monte OU are VOCs that have been detected in groundwater in the El Monte OU. Table 5 lists these VOCs and their chemical-specific ARARs.

12.1.1 Federal Drinking Water Standards

EPA has established MCLs, 40 C.F.R. Part 141, under the Safe Drinking Water Act (SDWA), 42 U.S.C. §§ 300f-j, to protect public health from contaminants that may be found in drinking water sources. MCLs are applicable at the tap for water that is delivered directly to 25 or more people or to 15 or more service connections.

Under the SDWA, EPA has also designated Maximum Contaminant Level Goals (MCLGs), 40 C.F.R. Part 141, which are health-based goals that may be more stringent than MCLs. MCLGs are set at levels, including an adequate margin of safety, where no known or anticipated adverse health effects would occur. MCLGs greater than zero are relevant and appropriate where multiple contaminants in groundwater or multiple pathways of exposure present unacceptable health risks (EPA, 1988b). One chemical detected in the El Monte OU groundwater, 1,1,2-trichloroethane, has an MCLG that is more stringent than its MCL.

Under Section 300.430(f)(5) of the NCP, remedial actions must generally attain MCLs and nonzero MCLGs if the contaminated water is a current or potential source of drinking water. The 1995 Water Quality Control Plan for the Los Angeles Region (Basin Plan) designates all of the contaminated groundwater in the El Monte OU as current and potential sources of drinking water. However, since this ROD selects an interim remedial action to contain contaminant migration, no final cleanup standards are established for the restoration of groundwater. Final cleanup standards will be established in a Final ROD. For this Interim ROD, EPA has determined that the federal MCLs and nonzero MCLGs listed in Table 5 are ARARs for any groundwater that is extracted and used for domestic, municipal, industrial, or agricultural purposes, and for any groundwater that is discharged to the environment. In addition, these MCLs and MCLGs are ARARs for currently uncontaminated groundwater in the deep zone downgradient of the existing compliance wells established by the remedial action (EPA, 1988a).

If treated groundwater is to be delivered into a public water supply, all legal requirements for drinking water in existence at the time that the water is served will have to be met because EPA considers the service of water to the public to be an offsite activity.

12.1.2 California Drinking Water Standards

California has established state MCLs for sources of public drinking water, under the California Safe Drinking Water Act of 1976, Health and Safety Code (H&SC) §§ 4010.1 and 4026(c), California Code of Regulations (CCR) Title 22, §§ 64431 and 64444. Some state MCLs are more stringent than the corresponding federal MCLs. EPA has determined that the more stringent state MCLs are relevant and appropriate for the El Monte OU. There are also some chemicals that lack federal MCLs. Where state MCLs exist for chemicals that lack federal MCLs, EPA has determined that the state MCLs are relevant and appropriate for the El Monte OU. State MCLs apply to remedial actions in the El Monte OU in the same manner as federal MCLs. Table 5 identifies the state MCLs that are ARARs for this remedial action.

12.2 Location-specific ARARs

This ROD specifies performance criteria for the remedy. As such, the locations of remediation facilities (e.g., wells, treatment plant, and pipelines) are not specifically identified herein. Locations of remediation facilities will be determined during the remedial design, and will conform to the location-specific ARARs identified below.

12.2.1 Location Standards for TSD Facilities

California Code of Regulations, Title 22, Section 66264.18 establishes location standards for Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDFs). Subsection 66264.18(a) prohibits the placement of TSDFs within 200 feet of a fault displaced during the Holocene epoch. Subsection 66264.18(b) requires that TSDFs located within a 100-year floodplain be capable of withstanding a 100-year flood. These standards are applicable to the construction of any new groundwater extraction and treatment facilities used as part of this remedial action.

12.2.2 Endangered Species Act

The Endangered Species Act, 15 U.S.C. §§ 1531-1544, and implementing regulations, 40 C.F.R. § 6.302(h), 50 C.F.R. Parts 17, 222 and 402, are applicable to any remedial actions that impact a proposed or listed threatened or endangered species or destroy or adversely modify the critical habitat of a listed species. No endangered species are known or suspected to occur in the locations where remedial action facilities might be constructed. If, however, it appears during the implementation of the remedial action that construction activities or the discharge of treated groundwater might adversely affect a proposed or listed species, EPA will consult with the U.S. Fish and Wildlife Service (FWS) in accordance with 50 C.F.R. Part 402 and ensure that regulatory requirements are followed so that adverse impacts are avoided or mitigated.

12.2.3 California Fish and Game Code

California Fish and Game Code sections 2080, 5650(a), (b), and (f), 12015, and 12016 prohibit the discharge of harmful quantities of hazardous materials into places that may deleteriously affect fish, wildlife, or plant life. These provisions are applicable if the remedial action will result in the discharge of treated groundwater to surface waters.

12.2.4 National Historic Preservation Act

The National Historic Preservation Act and implementing regulations (16 U.S.C. § 470, 40 C.F.R. Part 6.301(b), 36 C.F.R. Part 800) require federal agencies or federal projects to take into account the effect of any federally assisted undertaking or licensing on any district, site, building, structure, or object that is included in, or eligible for, the Register of Historic Places. If remedial action is likely to have an adverse effect on any cultural resources that are on or near the El Monte OU, EPA will examine whether feasible alternatives exist that would avoid such effects. If effects cannot reasonably be avoided, measures will be implemented to minimize or mitigate the potential effect.

No cultural resources are anticipated in the vicinity of facilities for this remedial action. However, during preliminary design, a complete review of all impacted areas will be made.

12.2.5 Archaeological and Historic Preservation Act

This statute and implementing regulations, 16 U.S.C. § 469, 40 C.F.R. Part 6.301(c), establish requirements for the evaluation and preservation of historical and archaeological data that may be destroyed through alteration of terrain as a result of a federal construction project or a federally licensed activity or program. No sites of historical interest are anticipated in the vicinity of facilities for this remedial action. However, during preliminary design, a complete review will be made of impacted areas.

12.2.6 Historic Sites, Buildings, and Antiquities Act

The Historic Sites, Buildings, and Antiquities Act, 16 U.S.C. §§ 461-467, 40 C.F.R. Part 6.301(a), requires federal agencies to consider the existence and location of landmarks on the National Registry of Natural Landmarks to avoid undesirable impacts on such landmarks. The remedial action is not anticipated to affect any of the facilities regulated under the act. However, during preliminary design, a complete review will be made of impacted areas.

12.3 Action-specific ARARs

12.3.1 Local Air Quality Management

One VOC treatment technology that may be used is air stripping. Air emissions from air strippers are regulated by the California Air Resources Board, which implements the federal Clean Air Act (CAA), as well as the air pollution control requirements of the California H&SC, through local air quality management districts. Local districts may impose additional regulations to address local air emission concerns. The local air district for the El Monte OU is the South Coast Air Quality Management District (SCAQMD). The SCAQMD has adopted several rules that are ARARs for air stripper emissions and construction activities.

SCAQMD Regulation XIII, comprising Rules 1301 through 1313, establishes new source review requirements. Rule 1303 requires that all new sources of air pollution in the district use best available control technology (BACT) and meet appropriate offset requirements. Emissions offsets are required for all new sources that emit in excess of one pound per day.

SCAQMD Rule 1401 requires that best available control technology for toxics (T-BACT) be employed for new stationary operating equipment, so that the cumulative carcinogenic impact from air toxics does not exceed the maximum individual cancer risk limit of 10 in 1 million (1×10^{-5}). Many of the contaminants found in the El Monte OU groundwater are air toxics subject to Rule 1401.

SCAQMD Rules 401 through 403 are also ARARs for construction and operation of remedial action facilities. SCAQMD Rule 401 limits visible emissions from a point source. Rule 402 prohibits discharge of material that is odorous or causes injury, nuisance, or annoyance to the public. Rule 403 limits downwind particulate concentrations.

12.3.2 Federal Clean Water Act and California Porter-Cologne Water Quality Act

California's Porter-Cologne Water Quality Act incorporates the requirements of the federal Clean Water Act (CWA) and implements additional standards and requirements for surface and groundwaters of the state.

12.3.2.1 Water Quality Control Plan for the Los Angeles Region (Basin Plan)

The RWQCB formulates and enforces water quality standards through a Basin Plan. The Basin Plan identifies the beneficial uses of surface and groundwaters in the San Gabriel River watershed and establishes water quality objectives necessary to protect these beneficial uses. Water quality objectives impose limitations on receiving waters, rather than discharges, and are applicable to any water body that receives discharge from remedial activities in the El Monte OU.

The selected remedial action may result in the discharge of treated groundwater to Eaton Wash upstream from the Rio Hondo. Table 2-1 of the Basin Plan identifies the following beneficial uses for Eaton Wash and the Rio Hondo above the Rio Hondo Spreading Grounds:

- Municipal and domestic supply (potential beneficial use)
- Groundwater recharge (intermittent beneficial use)
- Water contact recreation (intermittent beneficial use)
- Noncontact water recreation (existing beneficial use)
- Warm freshwater habitat (potential/intermittent beneficial use)
- Wildlife habitat (existing beneficial use)

Since municipal and domestic water supply is a potential beneficial use of these surface waters, the MCLs listed in Table 1 are applicable as water quality objectives for Eaton Wash. In addition, the following water quality objectives from Table 3-8 of the Basin Plan are ARARs for Eaton Wash and the relevant segment of the Rio Hondo:

- Total Dissolved Solids: 750 mg/L
- Sulfate: 300 mg/L
- Chloride: 150 mg/L
- Boron: 1.0 mg/L
- Nitrogen (NO3-N + NO2-N): 8 mg/L

The Basin Plan also establishes water quality objectives for groundwater in the Main San Gabriel Basin (Table 3-10). These water quality objectives are applicable to any discharge that impacts groundwater.

12.3.2.2 State Water Resources Control Board Resolution 68-16

The Basin Plan also incorporates the State Water Resources Control Board (SWRCB) policy "Statement of Policy with Respect to Maintaining High Water Quality in California" (Resolution 68-16). Resolution 68-16 requires that existing water quality be maintained unless it is demonstrated that a change will benefit the people of California, will not unreasonably affect present or potential uses, and will not result in water quality less than prescribed by other state policies. Any activity that may increase the volume or concentration of a waste discharged to surface or groundwater is required to use the "best practicable treatment or control."

Resolution 68-16 is applicable to discharges of treated groundwater. If treated water is to be discharged to Eaton Wash, the RWQCB may require an evaluation of the potential impact of nitrate and TDS contained in treated groundwater on receiving waters and investigate alternative discharge options. If water quality impacts are minimal and alternative discharge options infeasible, the RWQCB may allow the discharge to Eaton Wash.

12.3.2.3 State Water Resources Control Board Resolution 92-49

Subsection III.G of the SWRCB's "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304" (Resolution 92-49) requires attainment of background water quality or, if background levels cannot be restored, the best quality of water that is reasonable. Resolution 92-49 is not an ARAR because this is an interim remedial action to contain the spread of contamination, rather than a final action to restore groundwater in the El Monte OU.

12.3.2.4 Standards Applicable to CERCLA Section 104(b) Discharges to Surface Waters

Site investigation activities undertaken pursuant to CERCLA § 104(b) are considered to be removal actions. It is EPA policy that removal actions "comply with ARARs to the extent practicable, considering the exigencies of the circumstances." (55 Fed. Reg. 8756).

It is possible that certain site investigation activities will take place during remedial design, which will result in temporary high-flow, high-volume discharges of contaminated groundwater (e.g., discharges from aquifer testing of extraction wells). EPA has considered the best available technology economically achievable (BAT) for treatment and disposal of these discharges. The three disposal options that EPA considered are: (1) onsite storage and disposal at a Resource Conservation and Recovery Act (RCRA)-approved hazardous waste facility, (2) discharge to a sanitary sewer for treatment at a wastewater treatment plant, and (3) onsite treatment and discharge to surface water channels. EPA has concluded that compliance with chemical-specific ARARs is not practicable, considering the exigencies of the circumstances, for many temporary high-flow, high-volume discharges.

EPA has determined that compliance with chemical-specific ARARs is practicable and necessary for CERCLA § 104(b) activities that do not result in temporary high-flow, high-volume discharges. EPA will determine the application of chemical-specific ARARs to CERCLA § 104(b) activities on a case-by-case basis. Where practicable, these discharges must comply with ARARs.

12.3.3 California Hazardous Waste Management Program

The federal RCRA establishes requirements for the management and disposal of hazardous wastes. In lieu of the federal RCRA program, the State of California is authorized to enforce its Hazardous Waste Control Act, and implement regulations (CCR Title 22, Division 4.5), subject to the authority retained by EPA in accordance with the Hazardous and Solid Waste Amendments of 1984 (HSWA). California is responsible for permitting treatment, storage, and disposal facilities within its borders and carrying out other aspects of the RCRA program. Some of the Title 22 regulations are applicable to the generation and disposal of hazardous wastes in the El Monte OU.

12.3.3.1 Hazardous Waste Generator Requirements

CCR Title 22 establishes requirements applicable to generators of hazardous waste. Implementation of the remedial action may generate hazardous waste as a result of ground-water monitoring and well installation (e.g., contaminated soil and groundwater and used personal protective equipment).

Hazardous waste may also be generated as a result of ground-water treatment to remove VOCs (e.g., spent carbon). These requirements are applicable to remedial actions in the El Monte OU.

The preamble to the NCP clarifies that when noncontiguous facilities are treated as one site, the movement of hazardous waste from one facility to another is subject to RCRA manifest requirements (55 Fed. Reg. 8691). Manifest requirements are ARARs in the event that the remedial action involve multiple water treatment units at different locations and require the movement of hazardous wastes (e.g., spent carbon) between these locations.

12.3.3.2 Land Disposal Restrictions

CCR Title 22 defines hazardous wastes that cannot be disposed of to land without treatment. Land disposal requirements are applicable to the disposal of spent carbon generated during the treatment of groundwater for removal of VOCs, if carbon adsorption is used, and the disposal of residuals associated with groundwater monitoring and well installation (e.g., contaminated soil and groundwater, used personal protective equipment).

12.3.3.3 Hazardous Waste TSD Facility Requirements

CCR Title 22, Division 4.5, Chapter 14, specifies Hazardous Waste TSDF requirements that regulate the design, construction, operation, and closure of RCRA-permitted TSDFs. Since the contaminated groundwater is sufficiently similar to RCRA hazardous wastes, Title 22 TSDF requirements are relevant and appropriate for the design, construction, operation, and closure of any ground-water treatment systems. The Title 22 ARARs include the substantive requirements of the following provisions:

- Section 66264.14: Security Requirements
- Section 66264.25: Seismic and Precipitation Standards
- Section 66264.94: Groundwater Protection Standards
- Sections 66264.111-115: Closure of Treatment Units
- Sections 66264.170-178: Use and Management of Containers
- Sections 66264.600-603: Standards for Miscellaneous Treatment Units

12.4 ARARs Waivers

This interim remedial action shall comply with all ARARs described in this section. Because this is an interim action for containment of groundwater contamination, EPA has not established chemical-specific ARARs for restoration of groundwater remaining onsite. These ARARs will be addressed in the Final ROD for the El Monte OU.

13 Statutory Determinations

Under CERCLA Section 121, EPA must select remedies that are protective of human health and the environment, comply with applicable or relevant and appropriate requirements (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ, as a principal element, treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes. The following sections discuss how the selected remedy meets these statutory requirements.

13.1 Protection of Human Health and the Environment

The selected remedy will protect human health and the environment by limiting further downgradient migration of contaminated groundwater and preventing the existing groundwater contamination from impacting current groundwater users. The remedy will also remove contaminant mass from the aquifer. The selected remedy will reduce potential risks by decreasing the likelihood and magnitude of future exposure to contaminated groundwater. Contaminant concentrations in the groundwater in the areas to be addressed by the remedy are currently well above acceptable levels. Available treatment technologies are technically feasible and proven effective in meeting ARARs for VOCs in the treated groundwater and air. Implementation of the remedy will not pose unacceptable short-term risks. In addition, no adverse cross-media impacts are expected.

13.2 Compliance with ARARs

The selected remedy shall comply with all ARARs described in Section 12 of this interim ROD. Because this is an interim action for the containment of groundwater contamination, EPA has not established chemical-specific ARARs for restoration of groundwater.

13.3 Cost-Effectiveness

EPA believes the selected remedy is cost-effective for addressing migration of contaminated groundwater in the El Monte OU. Section 300.430(f)(ii)(D) of the NCP requires EPA to determine cost-effectiveness by evaluating the cost of an alternative relative to its overall effectiveness. Effectiveness is defined by three of the five balancing criteria: long-term effectiveness, short-term effectiveness, and reduction of toxicity, mobility and volume through treatment. The overall effectiveness is then compared to cost to ensure that the selected remedy is cost-effective.

The estimated present worth cost of the selected remedy is $22,670,000. Although the other four alternatives are less expensive, migration of groundwater contamination in the deep aquifer is not addressed in any of the other alternatives. EPA believes that the additional cost to contain contaminant migration in the deep aquifer provides a significant increase in protection of human health and the environment and is cost-effective.

13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

As an interim remedial action, EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner in the El Monte OU. EPA has also determined that the selected remedy provides the best balance of tradeoffs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element and considering state and community acceptance.

The selected remedy satisfies the long-term effectiveness criterion by removing VOC contamination from the groundwater and destroying the VOCs during carbon regeneration. Groundwater containment through extraction effectively reduces the mobility and volume of and potential for exposure to site-related contamination. The selected remedy does not present any short-term risks that can not be readily mitigated and EPA expects that the implementability issues associated with the selected remedy can be resolved in a timely manner.

13.5 Preference for Treatment as a Principal Element

By treating the contaminated groundwater through air stripping or liquid-phase carbon adsorption, the selected remedy addresses the site contamination through the use of treatment technologies. By using treatment as a significant portion of the remedy, the statutory preference for remedies that employ treatment as a principal element is satisfied.

13.6 Five-Year Reviews

Because the remedy will result in hazardous substances remaining onsite above levels that allow for unlimited use and unrestricted exposure, EPA shall conduct a review of the remedy at least once every 5 years after initiation of remedial action. The review will assess whether the remedy continues to provide adequate protection of human health and the environment. If it is determined that the remedy is no longer protective of human health and the environment, then modifications to the remedy will be evaluated and implemented as necessary.

14 Documentation of Significant Changes

The Proposed Plan for the El Monte OU was released for public comment in October 1998. The Proposed Plan identified Alternative 5, Shallow Groundwater Control in Western and Eastern El Monte OU Plus Deep Groundwater Control, as the Preferred Alternative for addressing groundwater contamination in the El Monte OU. EPA reviewed written and verbal comments submitted during the public comment period. It was determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary.

Part III
Responsiveness Summary

Part III - Responsiveness Summary

This Responsiveness Summary portion of the interim Record of Decision (ROD) presents the U.S. Environmental Protection Agency's (EPA) responses to the written and significant oral comments received at the public meeting and during the public comment period. Comments were received from one individual, one water purveyor, and the Northwest El Monte Community Task Force (NEMCTF), a group of potentially responsible parties in the El Monte OU who conducted the Interim RI/FS for the El Monte OU. The section is divided into responses to written comments and responses to oral comments. Comments are expressed in *italics*, EPA's responses in plain text.

1 Responses to Written Comments

This section provides responses to written comments received by EPA during the public comment period. Written comments were received from Mr. Glen E. Powell, CPM; the San Gabriel Valley Water Company (SGVWC); and the NEMCTF.

1.1 Responses to Comments from Mr. Glen E. Powell

Powell Comment. *EPA Fact Sheet which is seeking WRITTEN AND VERBAL COMMENTS from the Public on its plan of remediation of the El Monte Operable Unit ground water. EPA prefers the most expensive alternative without consideration of Nature's Natural Process of cleansing itself.*

I believe that it is not in the best interest of our Government and out Nation to press for a harsh punishment on OWNERSHIP of PROPERTY which Congress has discouraged on Real Estate Investments of properties located in the San Gabriel Valley. They have pronounced without ANY consideration of PUBLIC LAND FILLS commonly known as PUBLIC DUMPS, which are ALL a matter of PUBLIC RECORDS located in this El Monte Area. should be taken into consideration for minor pollution found on ALL properties located in the line of flow of our natural underground surface water flow (maps attached).

Since ALL PROPERTIES IN THE SAN GABRIEL VALLEY are guilty of using these PUBLIC DUMPS in the past, our present PROBLEM should be treated on the same basis as our aging sewer problem, with a reasonable tax on ALL PROPERTIES using this ground water based upon the amount used. There is an increase use of this ground water today (with the increase in our San Gabriel Valley population), which is being drawn from this underground water supply. This increase volume of water used, will free up capital, which is now being demanded (by the EPA) from those, who may not have owned the property being named as a major polluter, which they now hold and have capital investment interest in the property, but did not have at the time of the supposed claim of pollution. This will help to free up capital

167

which builds factories, multifamily and office buildings and shopping centers that in turn produce jobs, increased income and wealth.

A bill has been introduced to facilitate larger quantities of run-off water to flow into the valley, to help clean existing water supplies and allow for more water storage for use during drought years has been introduced by MARTIN GALLEGOS, D.C. Assembly member for our fifty-seventh District Chair, Assembly Health Committee for The State of California.

EPA's Response. The comment references EPA's preference for "the most expensive alternative without consideration of Nature's Natural Process of cleansing itself." EPA did consider the benefits of natural attenuation processes to help address the contamination. A portion of the shallow contamination found in both the western and eastern portions of the El Monte OU is being allowed to naturally attenuate. However, natural attenuation processes alone are not sufficient to inhibit contaminant migration in the El Monte OU. Without active containment in the shallow and deep zones, contaminants will continue to migrate at unacceptable concentrations impacting downgradient areas that are currently either clean or only slightly contaminated.

In the El Monte OU, EPA only plans to identify potentially responsible parties (PRPs) for contributing to the cleanup where there is strong evidence that contamination originating onsite at a specific facility or property has directly impacted the groundwater. Properties will not be named simply because they have "minor pollution" and are "in the line of flow." EPA is not aware of any public dumps in the El Monte OU area that could be potential sources of the types of contaminants (VOCs) that are driving the need for the remedy presented in this ROD.

1.2 Responses to Comments from San Gabriel Valley Water Company

San Gabriel Valley Water Company (SGVWC) Comment. *San Gabriel Valley Water Company ("San Gabriel") is a public utility providing water service to all or portions of 18 cities in Los Angeles County, including areas within and immediately adjacent to the El Monte Operable Unit ("El Monte OU"). San Gabriel's Plant No. 8 is a key water production facility located near the intersection of Rosemead Boulevard and Garvey Avenue in South El Monte, which is just southwest of the El Monte OU. Unfortunately, VOC contamination has been detected in four of the five wells at Plant No. 8, with three wells now exceeding the MCL for PCE.*

On page 2 of the 12 page summary of the El Monte OU Proposed Plan, in the "Site Background" commentary, it states that "groundwater flow in the El Monte OU is principally from east to west. However, there is also a southerly component of groundwater flow in the eastern portion of the Operable Unit." Additionally, Figure 3: 1997 Deep VOC Contamination shows a large swath of detectable VOC contamination covering a substantial area north and south of the I-10 freeway and extending south and west beyond the area shown by the map.

Given these findings, San Gabriel is concerned that VOCs from the El Monte OU could be a source of the VOC contamination at our Plant No. 8 and might cause the contamination to worsen. Therefore, before any alternative cleanup plans can be selected, EPA must first determine whether and to what extent the El Monte OU contamination plume is affecting the company's wells at Plant No. 8. Of course, to the extent that the El Monte OU contamination is affecting the Plant No. 8 wells, the preferred alternative needs to be revised to provide wellhead treatment at Plant No. 8.

EPA's Response. The SGVWC comment references text in the El Monte OU Proposed Plan that describes a southerly component of groundwater flow in the eastern portion of the of El Monte OU. This southerly component of groundwater flow was found only in the shallow zone. The water level data collected during RI activities in both the El Monte and South El Monte OUs indicate that groundwater

flow directions in the deeper zone in this area are from east to west. Available data indicate that the contamination impacting SGVWC's Plant No. 8 originates east or southeast of SGVWC's well field, not from the El Monte OU to the north and northeast.

Water quality monitoring has not detected exceedances of drinking water standards (MCLs) along the southern boundary of the El Monte OU. This also supports the conclusion that the contamination impacting SGVWC's Plant No. 8 wellfield is more likely coming from sources in the South El Monte OU.

The selected remedy for the El Monte OU is intended to contain deep contamination in the southern portion of the OU. This should prevent El Monte OU contamination from impacting downgradient areas (either in the South El Monte OU or further west/southwest) in the future.

1.3 Responses to Comments from the Northwest El Monte Community Task Force (NEMCTF)

NEMCTF Comment No. 1. *USEPA's Proposed Plan states that the shallow aquifer within the EMOU is considered a drinking water source by the State of California. We point out that USEPA fails to acknowledge the fact that the shallow aquifer is not usable for drinking water purposes due to high concentrations of Total Dissolved Solids and Nitrate. These two compounds may be naturally occurring. It is clear that these two compounds are not related to the operations of the businesses that comprise the NEMCTF. We recognize that the State's designation of potential drinking water sources includes aquifers which may have limitations on their use as a result of pre-existing water quality constraints. It is essential, however, that such significant water quality limitations evidenced within the EMOU shallow aquifer be taken into consideration in determining the remedy.*

EPA's Response. EPA acknowledges that portions of the shallow aquifer in the El Monte OU area currently have elevated concentrations of nitrate and total dissolved solids (TDS) that make it unlikely they would be used as a drinking water supply in the near term. EPA has taken this information into account in selecting the remedy. First, there are substantial long-term benefits associated with inhibiting migration within the shallow zone. These benefits include: limiting the potential for vertical migration from the shallow zone to deeper zones that are currently used for drinking water supply, and limiting the potential impacts on downgradient shallow zones that may be more amenable to future use as water supply. There is considerable contamination in the deep zone in the El Monte OU and vicinity, indicating the existence of vertical migration pathways from the shallow zone to the deeper zone. The larger the extent of contamination in the shallow zone, the greater the potential for vertical migration into the deeper zone.

Second, EPA's performance criterion for the shallow groundwater zone reflects the current absence of domestic production in that zone. (See Part II, Section 11.1). The performance criteria for the deep groundwater zone require containment of contamination above MCLs because the deep zone is an existing source of drinking water. In contrast, the criterion for the shallow zone establishes the containment threshold at 10 times MCLs because the shallow zone is not likely to be used as a source of drinking water in the near future and the lower threshold is expected to protect the deep zone and uncontaminated portions of the shallow zone from further contaminant migration.

NEMCTF Comment No. 2. *USEPA's Proposed Plan describes USEPA's summary of site risks. USEPA concludes that it is "reasonable" to expect that the public will be exposed to contaminated groundwater* *at unacceptable levels unless a very costly remedy is implemented. We point out that USEPA's contemplated scenario is highly unlikely to occur; and, would in fact necessitate the occurrence of a series of unlawful acts. USEPA's Proposed Plan assumes that someone would install a potable water supply well, without obtaining a permit, into the shallow aquifer in an area containing the highest levels of contamination and located directly beneath an industrial facility. This USEPA scenario assumes the violation of existing legislation enacted and promulgated to preclude such an outcome.*

USEPA's Proposed EMOU Remedial Plan further assumes that the party who installed the water supply well would deliver this highly contaminated water to the public for drinking, without treatment, over a time horizon of 30 years. USEPA has characterized a scenario that combines a series of ongoing unlawful acts over an extensive period of time to create the exposure pathway that USEPA relies on as "reasonably expected to occur". We take issue with these contentions.

We further believe that USEPA's construct of a practically impossible scenario as a basis for evaluating site risks is wholly inconsistent with USEPA's own Risk Assessment Guidance for Superfund (RAGS; EPA, 1989). The NEMCTF therefore requests that USEPA base any remedial design within the EMOU on a more credible analysis of actual or potential risks than those asserted in the Proposed Plan.

EPA's Response. The Proposed Plan does not conclude that, "it is reasonable to expect that the public will be exposed to contaminated groundwater at unacceptable levels" without the remedy. The Proposed Plan presents risks that are the maximum risks that could reasonably be expected if the future exposure occurs. The likelihood that these potential future exposures will occur is not discussed. The first paragraph of the Summary of Site Risks section of the Proposed Plan does note that the exposure scenarios evaluated assume the absence of regulatory controls (existing regulatory controls limit the potential for exposure).

We strongly disagree that the exposure assumptions used in the Preliminary Baseline Risk Assessment are inconsistent with EPA's 1989 RAGS. The El Monte OU Baseline Risk Assessment was performed in accordance with RAGS and, specifically, the assumptions regarding exposure to contaminated groundwater in a potential drinking water aquifer are consistent with EPA guidance.

The selected interim remedy is not a "risk-based" interim remedy. The primary goal of this interim remedy is to provide containment of contaminated groundwater to protect the groundwater resource from further degradation and to minimize further impacts to water purveyors. Risk was only one factor considered in deciding whether to take action at the El Monte OU. The remedial design will not be based on the results of the risk assessment, rather it will be based on compliance with the performance requirements presented in this ROD.

During the RI/FS process, the NEMCTF commented on EPA's Preliminary Baseline Risk Assessment in a May 6, 1998 letter. EPA is providing a letter response to those comments which will be included in the Administrative Record for the El Monte OU.

NEMCTF Comment No. 3. *USEPA's Proposed Plan states that the shallow aquifer with the EMOU is considered .... On Page 3 of the Proposed Plan, USEPA presents two maps which are intended to profile the extent of VOC contamination. The maps are highly generalized and simplified depictions of VOC concentrations averaged over a five year, or greater, period of time. We request that USEPA acknowledge the considerable uncertainties and potential inaccuracies reflected in these two maps.*

EPA's Response. EPA generally concurs with the comment regarding the VOC contamination maps. The maps are simplified and fairly general. The following text is typically included on these maps, but was not included in the El Monte OU Proposed Plan to simplify the figures.

> "The areas of contamination shown represent simplified approximations based on the last available concentration (through November 20, 1997) of any VOC. Data points more than five years old were

not considered.

Because contaminant concentrations vary with time, a well may at times produce water with different contaminant levels than those indicated. Differences could also be caused by vertical variations in concentration (the figure is a two-dimensional depiction of contamination that actually varies with depth).

The figure shows only regional variability in contamination. In much of the basin, distances between data points are in the 1,000s of feet. Thus, there is significant uncertainty in the true locations of the concentration contours."

NEMCTF Comment No. 4. *In its analysis of the various remedial Alternatives, USEPA notes that Alternatives 1 and 2 do not meet several of their criteria. Given that these two Alternatives were crafted by USEPA to include the previously described unlawful acts associated with supplying untreated, highly contaminated groundwater as a potable water supply over time, it is presupposed by USEPA that Remedial Alternatives 1 and 2 would not comply with state or federal requirements*

EPA's Response. The comment incorrectly interprets the analysis of Alternatives 1 and 2 in relation to the evaluation criteria. The reasons that these alternatives do not meet several of the criteria are <u>not</u> related to the potential long-term use of the shallow, highly contaminated groundwater as a potable water supply. The following text, summarized from the El Monte OU Final FS, describes why these alternatives do not meet or are ranked low for the various criteria:

<u>Overall Protection of Human Health and the Environment</u>- Alternatives 1 and 2 provide the least overall protection of human health and the environment. Neither alternative has an active remedy component that provides migration control or containment of the contaminated groundwater other than groundwater management actions which regulate groundwater pumping in the San Gabriel Basin.

<u>ARARs</u>- These alternatives do not meet the ARARs criteria because both alternatives allow continued migration of contaminants and also may not ensure compliance with MCLs established by the federal or state Safe Drinking Water Acts.

<u>Long-Term Effectiveness</u>- Alternatives 1 and 2 are ranked low for this criterion because neither alternative has an active remedy component that provides migration control or containment of the contaminated groundwater. Contaminated groundwater would continue to migrate downgradient.

<u>Reduction in Toxicity, Mobility and Volume</u>- Alternatives 1 and 2 do not provide any increased reduction in toxicity, mobility, or volume over existing conditions and do not satisfy the statutory preference for treatment.

NEMCTF Comment No. 5. *In describing Remedial Alternatives 3 and 4, USEPA notes the purported value of these alternatives in "inhibiting" the migration of contaminants from the shallow to the deep aquifer. However, USEPA fails to point out that this assumed potential migration is already significantly inhibited by the natural subsurface materials. The San Gabriel Basin Watermaster has stated that existing shallow and deep data "appear to confirm the effectiveness of clay layers in controlling the vertical migration of contaminants in the study area." Prior to making a final selection of a remedy in the Record of Decision, the NEMCTF group of companies requests that USEPA quantitatively analyze whether the remedy actually provides any further substantive benefit in inhibiting vertical migration into the deep aquifer when compared to naturally occurring impediments to such migration, as well as facility-specific source control actions.*

EPA's Response. The comment fails to acknowledge the considerable extent of deep contamination that currently exists in the El Monte OU, indicating that vertical migration from shallow to deep zones does occur in the El Monte OU. Although EPA agrees that the presence of fine-grained materials does act to reduce the magnitude of vertical migration, we do not concur with the Watermaster's conclusion that clay layers are effective in "controlling the vertical migration of contaminants."

There are insufficient data available to "quantitatively analyze" the difference between vertical migration under the remedy compared to vertical migration without the remedy. However, given the current occurrence of deep contamination extending over a large area and the potential presence of numerous man-made conduits (i.e., old production wells), it is reasonable to expect that inhibiting further migration of shallow contamination will reduce the potential for additional vertical migration into the deep zone.

NEMCTF Comment No. 6. *USEPA states a preference for Remedial Alternative 5. This is far and away the most costly remedial alternative. USEPA notes that their approach "provides for flexibility in implementation." Yet, elsewhere in the Proposed Plan there are several references to USEPA intending to "extract and treat" groundwater. USEPA appears to be ignoring its own policy and guidance. USEPA policy and guidance documents state that USEPA should evaluate the effectiveness of focused source control actions coupled to Monitored Natural Attenuation. Aggressive source control actions are already underway at several of the NEMCTF facilities located within the EMOU. USEPA has failed to factor the effectiveness of such actions into their Proposed Plan. We request that USEPA (a) clearly and fully evaluate the beneficial effects of on-going facility-specific actions before selecting the remedy, and (b) coordinate closely with the LARWQCB to identify any additional facilities where remedial actions are appropriate. Where such additional actions would increase the effectiveness or reduce the costs of the CERCLA remedy, USEPA should both ensure that the LARWQCB mandates the implementation of such actions, and incorporate the resulting benefits into the selection of the remedy.*

EPA's Response. EPA disagrees with the assertion that it is "ignoring its own policy and guidance." In accordance with the performance-based remedy described in this ROD, if source control actions and natural attenuation are sufficient to inhibit further contaminant migration, then active pumping will not be necessary in the shallow groundwater zone and pumping may be limited in the deep zone. However, EPA believes that it is very likely that extraction and treatment will be needed at least in portions of both the shallow and deep zones to meet the remedial objectives and performance requirements developed for this remedy.

Aggressive source control actions undertaken at individual facilities certainly have the potential to reduce the magnitude of shallow zone extraction and treatment that may be required to meet the performance-based requirements of this remedy. There is no need to evaluate the beneficial effects of on-going facility-specific actions before selecting a remedy. If they are adequate to inhibit contaminant migration, this will be apparent in the monitoring to be performed at the "early-warning" and compliance monitoring wells that will be used to monitor this remedy.

EPA is continuing to work with the Los Angeles Regional Water Quality Control Board regarding appropriate site-specific actions at facilities in the El Monte OU.

NEMCTF Comment No. 7. *As USEPA is aware, the NEMCTF, in cooperation with the San Gabriel Basin Water Quality Authority (WQA), is voluntarily implementing an aggressive field program to collect additional data that will be helpful in selecting and designing the remedy. We believe that it is presently premature and inappropriate for USEPA to select the remedy for the EMOU without considering the additional data in progress and incorporating these essential data and related analyses into the final remedy selection process. We look forward to continuing the cooperative working relationships between the NEMCTF and USEPA to ensure that all necessary information has been collected and evaluated prior to remedy decisions.*

EPA's Response. EPA has reviewed the initial results generated from the shallow monitoring wells installed as part of the Early Response Action Program (ERAP) referred to in this comment. Those results were taken into consideration in developing this ROD. EPA agrees that the additional data to be collected as part of the ERAP will be very helpful in designing the El Monte OU interim remedy and in ultimately monitoring performance of the remedy. However, this ROD describes a performance-based remedy and does not specify specific remedy components. EPA does not believe that any additional data to be generated through the ERAP after the ROD is signed will affect the performance-based requirements of the remedy described in this ROD.

2 Responses to Oral Comments

In this section, EPA provides responses to oral comments received at the public meeting held on November 18, 1998. EPA responded to a number of questions directly at the public meeting. This section provides responses only to formal oral comments that were not fully addressed at the meeting. Formal oral comments were received from three parties: Mr. Ken Russo, representing the Northwest El Monte Community Task Force (NEMCTF); Mr. David Chamberlin of Camp, Dresser, & McKee (CDM), consultants for the NEMCTF; and Mr. Tom Schmidt, representing Hermetic Seal Corporation, a member of the NEMCTF. The full transcript of the public meeting is available at EPA's Superfund Records Center at EPA's Regional Office in San Francisco, and locally at two information repositories: the West Covina Library and the Rosemead Library.

2.1 Response to Comments from Ken Russo of the NEMCTF

This section presents excerpts from Mr. Russo's oral comments and provides EPA's responses to those specific portions of Mr. Russo's comments. The entire text of Mr. Russo's statement can be found beginning on Page 33 of the attached meeting transcript.

Mr. Russo's Comments, Transcript Page 35, Line 15 through Page 36, Line 22. *Let's talk about the VOC contamination as that is the main issue we are here to talk about tonight. It did not come from deliberate dumping of solvents into the soil, and this is an important issue to understand. Originally, concrete walled clarifiers were installed below ground at businesses in order to comply with government regulations regarding the clarity of industrial waste water flowing into the sanitary sewer system.*

EPA's Response. Clarifiers were not the only source of VOC releases that contributed to the groundwater contamination. In addition to leaking or damaged clarifiers, VOC contamination in the groundwater has come from vapor degreasers, waste storage areas, chemical handling and storage areas, stripping tank/leach pit areas, paint booth areas, processing areas, drain pipes, and drainage sumps.

Mr. Russo's Comments, Transcript Page 38, Lines 2 through 4. *Fourteen years later and still no groundwater cleanup in El Monte.*

EPA's Response. Although broad, sub-regional remedial actions have not been initiated in the El Monte OU, limited groundwater cleanup has occurred in the OU area. RWQCB investigations, funded by and coordinated with EPA, have led to a groundwater remediation system being installed at the Hermetic Seal facility. Also, water purveyors have installed wellhead treatment to remove contaminants from groundwater extracted from contaminated portions of the deeper aquifer.

Mr. Russo's Comments, Transcript Page 38, Line 23 through Page 39, Line 2. *Yet today, under the Superfund process, we are still not viewed as having sufficient information to proceed with actual cleanup. We will be expected to spend hundreds of thousands more dollars to continue studying the situation.*

EPA's Response. This statement is not correct. Sufficient information <u>has</u> been collected in the El Monte OU to proceed with the cleanup. Field activities that the NEMCTF has recently initiated are intended as a component of the remedial design to help refine design parameters and provide data points for monitoring remedy compliance with performance standards.

If the NEMCTF would like to accelerate implementation of the remedy in the El Monte OU, EPA would be happy to review their plans for getting started. EPA has selected a performance-based approach, in part, because of NEMCTF concerns about the need for active extraction and treatment actions in some areas. If the NEMCTF is prepared to proceed with active cleanup actions, the performance standards in this ROD allow for a flexible approach such that this is possible. EPA looks forward to continuing to work with the NEMCTF as this cleanup work is implemented.

Mr. Russo's Comments, Transcript Page 39, Lines 10 through 20. *The first thing that we learned from the RI/FS study is that, fortunately, the level of groundwater contamination in the El Monte Operable Unit is limited both in concentration and extent, and a lot of the maps that you saw here tonight are not current maps based upon all the money we spent together gathering additional data. The contamination in El Monte is particularly small when compared with the levels found in the Baldwin Park Operable Unit. This is an entirely different site.*

EPA's Response. EPA agrees that data collected during the RI/FS indicate that groundwater contamination in the El Monte OU does not appear to extend far beyond the boundaries of the OU. However, more recent sampling by the NEMCTF suggests that in some regions, contamination extends beyond the parameters described in the RI/FS.

This comment is incorrect in stating that EPA used outdated maps at the public meeting. The maps of contamination presented by EPA are current through the end of the El Monte OU RI and incorporate the RI data generated by the NEMCTF. The maps were prepared using data from the RI supplemented with extensive additional information from site assessment wells that EPA did not specifically require the NEMCTF to sample during their RI activities. Although the wells were sampled outside of the RI process, the data from them is still considered valid and representative.

Mr. Russo's Comments, Transcript Page 41, Lines 3 through 12. *I believe that approach should be as follows. First, the original sources of contamination are underground clarifiers. We need to remove any old-style, single-wall, underground clarifiers still in the ground, and we need to do it now. Then each site that had such clarifiers needs to clean its soil to remove the VOCs through use of a soil vapor extraction system. Until this is accomplished, VOCs will continue to migrate from the soil into the groundwater.*

EPA's Response. EPA agrees that facilities with high on-site soil gas concentrations should clean up their vadose zone contamination. In addition to clarifiers, VOC contamination in the San Gabriel Valley has come from degreasers, cracked piping, chemical storage and work areas, and disposal locations. EPA continues to work with the RWQCB to determine appropriate site-specific remedial actions at facilities in the El Monte OU area. A number of facility owners and operators have been required to clean their soils using soil vapor extraction. For some facilities, the concentrations of VOCs remaining in the soil are not high enough to warrant soil vapor extraction. Facilities with damaged or leaking clarifiers and where chlorinated compounds were routinely used and/or stored, were requested by the RWQCB to perform soil matrix and soil gas sampling at their clarifier(s) or abandoned clarifier location(s), and required to replace or repair their clarifier(s).

Mr. Russo's Comments, Transcript Page 41, Lines 17 through 23. *[T]he task force wants to work with EPA and other agencies, including the San Gabriel Basin Water Quality Authority, the Regional Water Quality Control Board, and the City of El Monte to lay out a responsible, reasonable, and effective well network so as to remove VOCs from the shallow aquifer. Such a process needs to be cost effective.*

EPA's Response. EPA concurs with this statement and encourages the NEMCTF to continue to work with all local stakeholders to develop an appropriate, cost-effective extraction system for the shallow aquifer.

Mr. Russo's Comments, Transcript Page 41, Line 24 through Page 42, Line 5. *The shallow aquifer water has not been drinkable for many years because of the contamination from TDS and the nitrates as a* *result of farming in this area. It is not and should not be the responsibility of this task force to remove those contaminants that it did not generate in the first place.*

EPA's Response. The ROD does not require the treatment of total dissolved solids ("TDS") and nitrates in the groundwater, unless such treatment is necessary to properly use or dispose of groundwater that is treated for VOC contamination. If the parties implementing the remedial action intend to discharge treated groundwater to any surface waterbody, it will first be necessary to analyze the impact of the proposed discharge on surface water quality and evaluate the feasibility of other more beneficial uses for the treated water.

Mr. Russo's Comments, Transcript Page 42, Lines 5 through 10. *The significant reduction of VOCs in the shallow aquifer water along with natural attenuation over time should eliminate any future migration of any VOCs from the shallow aquifer into the deep aquifer, which is the source of our current drinking water.*

EPA's Response. EPA agrees that significant VOC removal from the shallow zone and natural attenuation will eventually eliminate migration from the shallow zone to the deep zone. However, this process will take a considerable length of time, during which continued vertical migration will occur. In addition, there is already a considerable extent of contamination in the deep aquifer that needs to be addressed, regardless of the effectiveness of remedial actions in the shallow zone.

Mr. Russo's Comments, Transcript Page 42, Lines 11 through 18. *[T]he water suppliers in the El Monte Operable Unit currently are using wellhead treatment to remove the limited VOCs now present in some of their water supply wells. These agencies need to continue that process until such time as Step No. 1 and No. 2, which I have just discussed, result in the elimination of VOCs in the deep aquifer.*

EPA's Response. EPA agrees that existing production wells, if properly situated and screened over appropriate intervals, can help meet the performance standards for the selected remedy and inhibit further contaminant migration. In these instances, it may be advantageous to incorporate the existing wells as a component of the remedial action.

Mr. Russo's Comments, Transcript Page 42, Lines 19 through 24. *Let's all reach consensus and move forward together as a unified group to put in place an effective and an affordable plan for clean water. We owe it to the residents, to the employees, and to the businesses in the El Monte area to get moving and to do it now.*

EPA's Response. EPA concurs with this statement and looks forward to working closely with the NEMCTF to implement the selected interim remedy in the El Monte OU.

2.2 Response to Comments from David Chamberlin of CDM, representing the NEMCTF

This section presents excerpts from Mr. Chamberlin's oral comments and provides EPA's responses to those specific portions of Mr. Chamberlin's comments. The entire text of Mr. Chamberlin's statement can be found beginning on Page 43 of the attached meeting transcript.

Mr. Chamberlin's Comments, Transcript Page 43, Lines 10 through 12. *...from a technical aspect, we're concerned with the characterization of the shallow aquifer as a drinking water source when it is not.*

EPA's Response. See response to NEMCTF written Comment No. 1

Mr. Chamberlin's Comments, Transcript Page 43, Lines 13 through 15. *We are concerned that the description of site risk as being reasonably expected to occur when they are not.*

EPA's Response. The Proposed Plan does not describe the site risk as being reasonably expected to occur. The Proposed Plan presents risks that are the maximum risks that could reasonably be expected if the future exposure occurs. The likelihood that these potential future exposures will occur is not discussed. The first paragraph of the Summary of Site Risks section of the Proposed Plan does note that the exposure scenarios evaluated assume the absence of regulatory controls (existing regulatory controls limit the potential for exposure).

Mr. Chamberlin's Comments, Transcript Page 43, Lines 16 through 20. *We're concerned that the depiction of the plume on page 3 of the proposed plan and on the wall behind me this evening that oversimplified and overstated the actual true conditions in the subsurface.*

EPA's Response. Although EPA agrees that the depictions of contamination in the El Monte OU presented in the Proposed Plan are simplified, we do not believe the maps significantly overstate the extent of contamination in the OU. These interpreted maps are based on data generated during the RI along with additional site assessment and production well data collected during a similar time frame.

Mr. Chamberlin's Comments, Transcript Page 43, Lines 21 through 25. *We're concerned about the overstatement of the potential risk for the contaminants to migrate from the shallow aquifer into the deeper aquifer. The data suggests that they have not to any degree of significance.*

EPA's Response. EPA disagrees with the conclusion that contaminants have not migrated from the shallow zone to the deep zone "to any degree of significance." This statement fails to acknowledge the considerable extent of deep contamination that currently exists in the El Monte OU, indicating that vertical migration from shallow to deep zones has and does occur in the El Monte OU. Although EPA agrees that the presence of fine-grained materials does act to reduce the magnitude of vertical migration, the large areas of deep zone contamination confirm that the physical conditions are not sufficient to stop vertical migration.

Mr. Chamberlin's Comments, Transcript Page 44, Lines 1 through 4. *And lastly we're concerned about the need for flexibility in meeting EPA's performance criteria by means other than the installation of new and costly extraction wells.*

EPA's Response. As described in this ROD, the performance standards for the selected remedy provide considerable flexibility for implementation of this remedy. New groundwater extraction wells will be needed only in areas where data indicate potential contaminant migration towards compliance monitoring wells.

2.3 Response to Comments from Tom Schmidt representing Hermetic Seal and the NEMCTF

This section presents excerpts from Mr. Schmidt's oral comments and provides EPA's responses to those specific portions of Mr. Schmidt's comments. The entire text of Mr. Schmidt's statement can be found beginning on Page 44 of the attached meeting transcript.

Mr. Schmidt's Comments, Transcript Page 45, Lines 1 through 11. *I must also say that I feel that [the members of the Northwest El Monte Community Task Force have] been unfairly picked out of all of the potentially responsible parties in the Valley and in the El Monte Operable Unit because they have voluntarily stepped to the plate.*

There are parties who are out there who have basically laid in the grass and have been allowed to do so by the regulatory agencies because they have garnered what they call -- what we call, I should say, the critical mass for getting the job done that the agencies want.

EPA's Response. In 1995 EPA sent Special Notice Letters to all of the PRPs that had been identified at that time. All but one of these PRPs joined together as the Northwest El Monte Community Task Force to undertake the Remedial Investigation and Feasibility Study for the El Monte OU. EPA issued a Unilateral Administrative Order to the one remaining PRP, Crown City Plating, which complied with the requirements of the Order. EPA identified four additional PRPs in 1997. EPA and the NEMCTF met with these PRPs and two of the four subsequently joined the NEMCTF. EPA is now making PRP determinations for the final group of facilities to be investigated in the El Monte OU. EPA will require that all PRPs share responsibility for implementation of the El Monte remedy.

Mr. Schmidt's Comments, Transcript Page 46, Lines 3 through 12. *I believe that there is an essential component that is missing. You cannot clean up the groundwater until all sources of soil contamination have been eliminated. And, I would urge all of the jurisdictions involved, especially the Regional Board, to move ahead and address a fashion to deal with those sources and to deal with parties who have either not come to the table or refused to come to the table in terms of taking on responsibility for their site conditions.*

EPA's Response. EPA concurs with the comment regarding the need to eliminate sources of soil contamination. The remedy selected in this ROD is an interim action intended to provide containment of the existing groundwater contamination. As this remedy is being implemented to ensure that future contaminant migration is limited, EPA will continue to work with the LA RWQCB to require appropriate facility-specific remedial actions that reduce future contaminant loading.

References

Camp Dresser & McKee, Inc. *El Monte Operable Unit Interim Remedial Investigation/Feasibility Study, Final Remedial Investigation Report, San Gabriel Valley, Los Angeles County, California.* Prepared for the Northwest El Monte Community Task Force. April 1998a.

————. *El Monte Operable Unit Interim Remedial Investigation/Feasibility Study, Final Feasibility Study Report, San Gabriel Valley, Los Angeles County, California.* Prepared for the Northwest El Monte Community Task Force. July 31, 1998b.

CDM. See Camp Dresser & McKee, Inc.

EPA. See U.S. Environmental Protection Agency.

U.S. Environmental Protection Agency. *Supplemental Sampling Program Report, San Gabriel Basin, Los Angeles, California.* Prepared by CH2M HILL. 1986.

————. *CERCLA Compliance with Other Laws Manual, Part I (Interim Final).* OSWER Directive 9234.1-01. 1988a.

————. *Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites.* OSWER Directive 9283.1-2. 1988b.

————. *CERCLA Compliance with Other Laws Manual, Part II.* OSWER Directive 9234.1-02. 1989.

————. *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions.* OSWER Directive 9355.0-30. April 22, 1991a.

————. *Interim San Gabriel Basin Remedial Investigation Report, Los Angeles County, California.* Prepared by CH2M HILL. July 1992a.

————. Integrated Risk Information System. Chemical Files. U.S. EPA Integrated Risk Information System Database. Office of Research and Development. Cincinnati, Ohio. 1995a.

————. *El Monte Operable Unit, Preliminary Baseline Risk, San Gabriel Basin, Los Angeles County, California.* Prepared by CH2M HILL. October 1997a.

Tables

Table 1
Summary of Chemicals of Concern and Exposure Point Concentrations in Groundwater
El Monte Operable Unit

Groundwater Area	Chemical of Concern	Frequency of Detection	Minimum Concentration (ppb)	Maximum Concentration (ppb)	Exposure Point Concentration (ppb)	Statistical Measure
Well Group 1 (Western El Monte OU)	PCE	33/53	ND	24,000	2,659	95% UCL
	TCE	49/53	ND	1,500	352	95% UCL
Well Group 2 (Eastern El Monte OU)	Carbon Tetrachloride	30/66	ND	59	6.6	95% UCL
	PCE	61/66	ND	1,510	344	95% UCL
	TCE	62/66	ND	4,600	841	95% UCL
Production Well 01900918	PCE	2/5	ND	1	0.8	95% UCL
	TCE	2/5	ND	2.5	2.0	95% UCL
Production Well 01902948	TCE	2/9	ND	12	0.6	95% UCL
Production Well 08000101	TCE	4/8	ND	1.2	0.8	95% UCL

Notes:
ND = non-detect
ppb = parts per billion or µg/L (micrograms per liter)
95% UCL = 95 per cent upper confidence limit on the arithmetic mean groundwater concentration.

Table 2
Estimated Total Excess Lifetime Cancer Risk from Domestic Use of Groundwater
El Monte Operable Unit

Wells	Average Exposure				Reasonable Maximum Exposure				Major Chemical Contributors
	Ingestion	Inhalation	Dermal	All Routes	Ingestion	Inhalation	Dermal	All Routes	
Production Well 01900918 [1]	7.8×10^{-8}	1.3×10^{-8}	6.5×10^{-9}	9×10^{-8}	7.5×10^{-7}	1.6×10^{-7}	7.9×10^{-8}	1×10^{-6}	None
Production Well 01902948 [1]	8.3×10^{-9}	4.5×10^{-9}	3.2×10^{-10}	1×10^{-8}	7.7×10^{-8}	4.2×10^{-8}	3.6×10^{-9}	1×10^{-7}	None
Production Well 08000101 [1]	1.2×10^{-8}	6.8×10^{-9}	4.8×10^{-10}	2×10^{-8}	1.0×10^{-7}	5.6×10^{-9}	4.8×10^{-9}	2×10^{-7}	None
Well Group 1 [2]	**1.6×10^{-4}**	**1.5×10^{-5}**	**1.8×10^{-5}**	**2×10^{-4}**	**1.7×10^{-3}**	**1.4×10^{-4}**	**2.3×10^{-4}**	**2×10^{-3}**	PCE
Well Group 2 [2]	**4.2×10^{-5}**	**9.7×10^{-6}**	**3.8×10^{-6}**	**6×10^{-5}**	**3.3×10^{-4}**	**7.8×10^{-5}**	**3.5×10^{-5}**	**4×10^{-4}**	PCE, TCE

[1] Data from these three active production wells were used to evaluate potential current risks in the El Monte OU area.

[2] Data from Well Group 1 (representing the highly contaminated portions of western El Monte OU) and Well Group 2 (representing the highly contaminated portions of eastern El Monte OU) were used to evaluate potential future risks in the El Monte OU area.

Table 3
Estimated Total Noncancer Hazard Index from Domestic Use of Groundwater
El Monte Operable Unit

Wells	Average Exposure				Reasonable Maximum Exposure				Major Chemical Contributors
	Ingestion	Inhalation	Dermal	All Routes	Ingestion	Inhalation	Dermal	All Routes	
Production Well 01900918 [1]	0.003	NA	0.0002	0.003	0.01	NA	0.0007	0.01	None
Production Well 01902948 [1]	0.001	NA	0.00004	0.001	0.003	NA	0.0001	0.003	None
Production Well 08000101 [1]	0.001	NA	0.00006	0.002	0.004	NA	0.0002	0.004	None
Well Group 1 [2]	**3**	0.04	0.3	**3**	**9**	0.09	**1**	**10**	PCE, TCE
Well Group 2 [2]	**2**	0.1	0.1	**2**	**5**	0.3	0.3	**6**	Carbon tetrachloride, PCE, TCE

[1] Data from these three active production wells were used to evaluate potential current risks in the El Monte OU area.

[2] Data from Well Group 1 (representing the highly contaminated portions of western El Monte OU) and Well Group 2 (representing the highly contaminated portions of eastern El Monte OU) were used to evaluate potential future risks in the El Monte OU area.

184

5

Table 4
Cost Comparison of Alternatives[1]
($1,000s)

Alternative	Capital Costs	Annual O&M Costs	Net Present Worth (30-years @ 5%)
2	$1,250	$200	$4,340
3	$2,990	$430	$9,620
4	$4,830	$570	$13,560
5	$7,930	$960	$22,670

[1] Net Present Worth is based on treatment for VOCs only.

185

Table 5
Chemicals of Potential Concern

Compound	ARAR (µg/L)	Source
1,1-Dichloroethane	5	California MCL
1,1-Dichloroethene	6	California MCL
1,1,1-Trichloroethane	200	Federal MCL
1,1,2-Trichloro-1,2,2-trifluoroethane	1,200	California MCL
1,1,2-Trichloroethane	3	Federal MCLG
1,2-Dichloroethane	0.5	California MCL
1,2,3-Trichlorobenzene	-	-
1,2,4-Trimethylbenzene	-	-
1,3-Dichlorobenzene	-	-
2-Propanone	-	-
2-Hexanone (methyl n-butyl ketone)	-	-
Benzene	1	California MCL
Bromoform[1]	100	Federal MCL
Carbon Disulfide	-	-
Carbon Tetrachloride	0.5	California MCL
Chloroethane	-	-
Chloroform[1]	100	Federal MCL
cis-1,2-Dichloroethene	6	California MCL
Dibromochloromethane[1]	100	Federal MCL
Methylene Chloride	5	Federal MCL
Tetrachloroethene	5	Federal MCL
Trichloroethene	5	Federal MCL
Trichlorofluoromethane	150	California MCL
Toluene	150	California MCL
Xylenes, total	1,750	California MCL

[1]These chemicals are trihalomethanes (THMs); the MCL listed is for all four THMs: chloroform, bromodichloromethane, dibromochloromethane, and bromoform.

Note: "-" indicates "no MCL has been established or proposed."

Table 6
Detailed Costs Estimates for the Selected Remedy
El Monte OU - Interim ROD

Component	Quantity	Unit	Unit Cost	Cost
Capital Costs (Including Engineering and Contingencies)				**Capital Costs**
Extraction Wells (Includes well pumps)				
100 ft. @ 30 gpm	11	ea.	$202,000	**$ 2,222,000**
300 ft. @ 100 gpm	1	ea.	$318,000	**$ 318,000**
300 ft. @ 125 gpm	1	ea.	$384,000	**$ 384,000**
300 ft. @ 150 gpm	2	ea.	$388,000	**$ 776,000**
Treatment Units (Air Stripping w/VGAC Off-Gas Treatment, includes discharge pumps)				
100 gpm System	1	ls.	$256,000	**$ 256,000**
150 gpm System	1	ls.	$557,000	**$ 557,000**
180 gpm System	1	ls.	$359,000	**$ 359,000**
425 gpm System	1	ls.	$468,000	**$ 468,000**
800 gpm System	1	ls.	$469,000	**$ 469,000**
Conveyance Systems (Pipelines)				
1.5-inch Diameter Pipelines	5,000	lf.	$15	**$ 75,000**
2-inch Diameter Pipelines	3,950	lf.	$20	**$ 79,000**
2.5-inch Diameter Pipelines	1,800	lf.	$25	**$ 45,000**
3-inch Diameter Pipelines	3,000	lf.	$30	**$ 90,000**
4-inch Diameter Pipelines	6,980	lf.	$40	**$ 279,000**
6-inch Diameter Pipelines	4,000	lf.	$60	**$ 240,000**
8-inch Diameter Pipelines	800	lf.	$80	**$ 64,000**
Monitoring Program				
Shallow Monitoring Wells	7	ea.	$71,000	**$ 497,000**
Deep Monitoring Wells	2	ea.	$349,000	**$ 698,000**
Well Abandonment	1	ls.	$50,000	**$ 50,000**
Total Capital Costs				**$ 7,926,000**

Annual Operations & Maintenance Costs (Including Engineering and Contingencies)

Component	Quantity	Unit Cost	Annual Costs	Present Worth Costs(1)
Extraction Wells (including pumping costs)				
100 ft. @ 30 gpm	11	$4,000	$44,000	**$ 676,000**
300 ft. @ 100 gpm	1	$6,000	$6,000	**$ 92,000**
300 ft. @ 125 gpm	1	$6,000	$6,000	**$ 92,000**
300 ft. @ 150 gpm	2	$7,000	$14,000	**$ 215,000**
300 ft. @ 800 gpm	1	$22,000	$22,000	**$ 338,000**
Treatment Units (including pumping, power, labor, and carbon costs)				
100 gpm System	1	$65,000	$65,000	**$ 999,000**
150 gpm System	1	$210,000	$210,000	**$ 3,229,000**
180 gpm System	1	$113,000	$113,000	**$ 1,737,000**
425 gpm System	1	$115,000	$115,000	**$ 1,768,000**
800 gpm System	1	$163,000	$163,000	**$ 2,506,000**
Monitoring Program				
Shallow Monitoring Wells	7	$5,000	$35,000	**$ 538,000**
Deep Monitoring Wells	2	$12,000	$24,000	**$ 369,000**
Monitoring Program - Existing Wells	1	$142,000	$142,000	**$ 2,183,000**
Total Annual O&M Costs			**$ 959,000**	
Total Discounted O&M Costs[1]				**$ 14,742,000**
Total Capital Costs				**$ 7,926,000**
Total Present Worth Costs				**$ 22,668,000**

Notes

(1) Based on 30-year project and 5% discount rate.

cost
estimates
are not
discounte

ls. = lump sum
lf. = linear foot
ea. = each

Figures

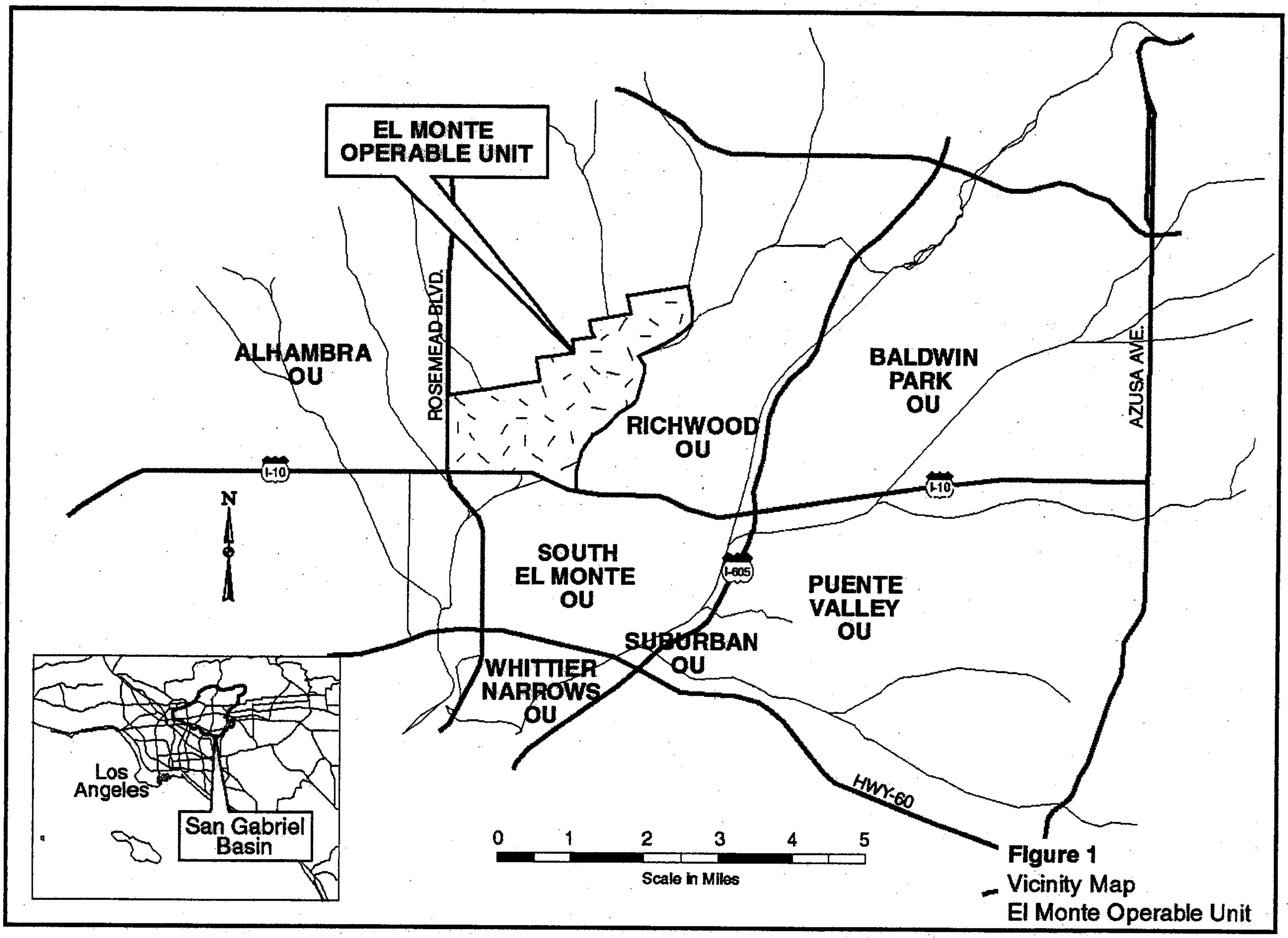
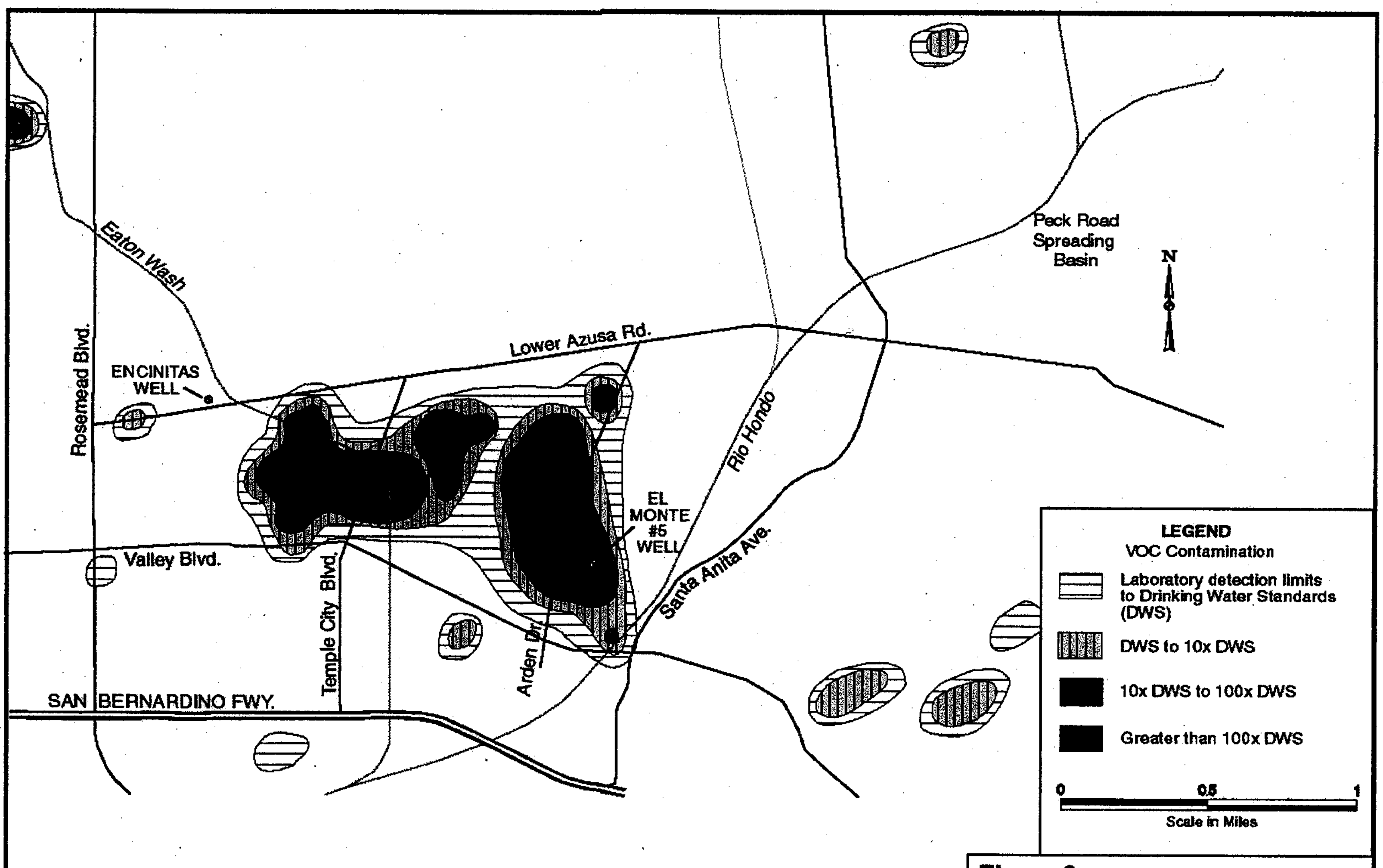


Figure 1
Vicinity Map
El Monte Operable Unit



This figure is intended to provide a conceptual depiction of the VOC distribution in the Shallow Zone. Because of the generalized nature of the Figure, which was composed using data spanning a five-year period and obtained from different data sources, actual VOC concentrations at specific locations within the El Monte OU may deviate from those shown on the Figure.

Figure 2
1997 Shallow VOC Contamination
El Monte Operable Unit

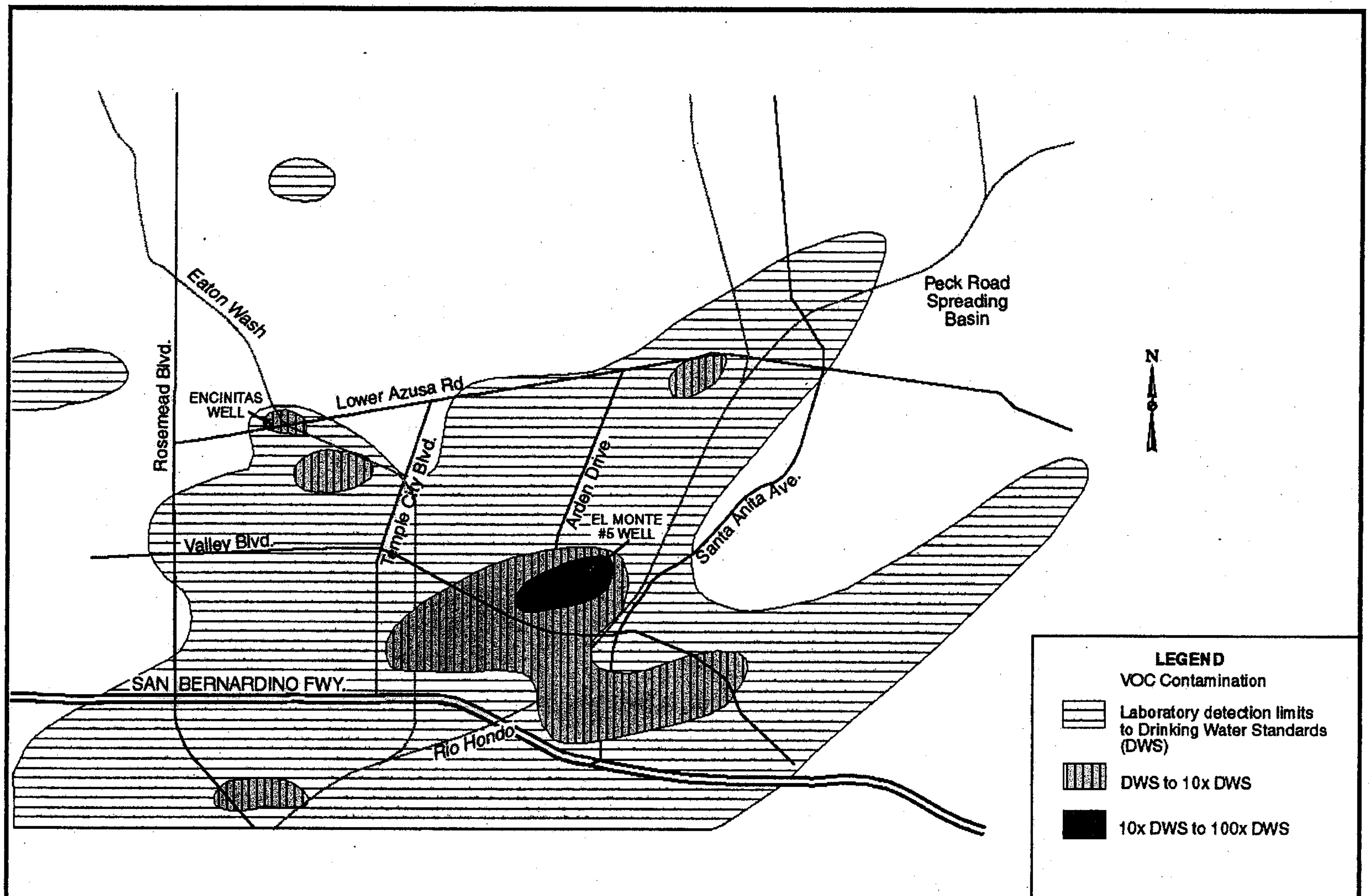


Figure 3
1997 Deep VOC Contamination
El Monte Operable Unit

This figure is intended to provide a conceptual depiction of the VOC distribution in the Deep Zone. Because of the generalized nature of the Figure, which was composed using data spanning a five-year period and obtained from different data sources, actual VOC concentrations at specific locations within the El Monte OU may deviate from those shown on the Figure.

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Groundwater Monitoring	Alternative 3 Shallow Groundwa-ter Control in Western EMOU	Alternative 4 Shallow Groundwater Control in Western and Eastern EMOU	Alternative 5 Shallow Groundwater Control in Western and Eastern EMOU plus Deep Groundwater Control
Overall Protectiveness	○	○	◓	◓	●
Compliance with ARARs	○	○	◓	◓	●
Long-term Effectiveness & Permanence	○	○	◓	◓	●
Implement-ability	not applicable	●	◓	◓	◓
Short-term Effectiveness	not applicable	◓	◓	◓	●
Reduction of Toxicity, Mobility or Volume by Treatment	○	○	◓	◓	●
Capital Cost O&M PWC	$0 $0 $0	$1.25 million $0.20 million $4.34 million	$2.99 million $0.43 million $9.62 million	$4.83 million $0.57 million $13.56 million	$7.93 million $0.96 million $22.67 million
State Agency Acceptance	○	○	○	○	●
Community Acceptance	○	○	◓	◓	◓

● = High ◓ = Medium ○ = Low

O&M = Annual Operations and Maintenance Cost

PWC = Present Worth Cost: 5% Discount Rate, 30 Years

Figure 4
Alternative Evaluation Matrix
El Monte Operable Unit

Appendix B

Explanation of Significant Differences

Appendix B to the Consent Decree

EXPLANATION OF SIGNIFICANT DIFFERENCES
TO THE 1999 RECORD OF DECISION
EL MONTE OPERABLE UNIT
SAN GABRIEL VALLEY SUPERFUND SITES, AREA 1

Introduction and Purpose

The United States Environmental Protection Agency (EPA) is updating the Superfund cleanup plan for the El Monte Operable Unit ("El Monte OU") of the San Gabriel Valley (Figure 1) in Los Angeles County, California in response to the detection, in 2000 and 2001, of several new pollutants in the groundwater underlying the area. The EPA adopted the original El Monte OU cleanup plan in 1999 after extensive public comment. The newly detected chemicals include:

- perchlorate, used in solid rocket fuel;
- hexavalent chromium, used in metal plating;
- N-nitrosodimethylamine (NDMA), found in liquid rocket fuel; and
- 1,4-dioxane, a stabilizer in chlorinated solvents.

In addition to the recently detected contaminants, groundwater in the El Monte OU is contaminated with perchloroethylene (PCE), trichloroethylene (TCE), and other chlorinated solvents. Chlorinated solvents are members of a group of chemicals called "volatile organic compounds" or VOCs.

The detection of perchlorate, hexavalent chromium, NDMA, and 1,4-dioxane will change the cleanup project in the El Monte OU in one significant way. The technologies typically used to remove chlorinated solvents from water (air stripping and carbon adsorption) do not effectively remove perchlorate, hexavalent chromium, NDMA, or 1,4-dioxane. If installation of additional treatment facilities is required to treat the newly detected contaminants in the groundwater, it will significantly increase the cost of the cleanup, as described below. Final decisions on treatment processes will be made during remedial design.

When significant changes are needed in a Superfund cleanup plan, the EPA informs the community through an Explanation of Significant Differences (ESD) or a Record of Decision (ROD) amendment. In this instance, EPA has determined that an ESD is appropriate. The remainder of the document provides a brief history of the El Monte OU cleanup, summarizes the 1999 cleanup plan, and describes the change to the 1999 plan in more detail.

EPA is issuing this Explanation of Significant Differences to satisfy its public participation responsibilities under CERCLA Section 117(c) and NCP Section 300.435(c)(2)(i).

This ESD will become part of the Administrative Record file for the El Monte OU pursuant to NCP Section 300.825(a)(2) and will be available to the public at the following locations:

EPA Region 9 Superfund Records Center
75 Hawthorne Street
San Francisco, CA 94105 • (415) 536-2000
The Record Center's hours are 8:00 am to 5:00 p.m., Monday through Friday.

West Covina Public Library
1601 West Covina Parkway
West Covina, CA 91790
(626) 962-3541

Rosemead Library
8800 Valley Boulevard
Rosemead, CA 91770
(626) 573-5220

For hours of operation, interested parties may call the libraries at the numbers listed above.

The ESD is also available on the EPA's web site at http://yosemite.epa.gov/r9/sfund/rodex.nsf under the San Gabriel Valley (Area 1) heading.

The El Monte Cleanup: A Brief History

The Context: San Gabriel Valley Groundwater Contamination

Groundwater contamination in the San Gabriel Valley was discovered in 1979. In 1984, the EPA added four portions of the San Gabriel Valley to the national Superfund list. The El Monte OU is officially part of the *San Gabriel Valley Area 1* Superfund site. Investigations by the EPA and others revealed the large extent of groundwater contamination in the El Monte OU and the San Gabriel Valley. During the past 20 years, numerous water supply wells throughout the San Gabriel Valley have been found to be contaminated with chlorinated solvents and other VOCs. In response to the contamination, water companies have shut down contaminated wells, installed new treatment facilities, and taken other steps to ensure that they can continue to supply water meeting State and Federal drinking water standards for VOCs.

Contamination of El Monte Groundwater

In 1998, the Northwest El Monte Community Task Force ("NEMCTF"), a group of fifteen parties considered potentially responsible for contamination of groundwater (Potentially Responsible Parties or "PRPs") in the El Monte area, completed the remedial investigation/feasibility study ("RI/FS") for the El Monte OU of the San Gabriel Valley Superfund sites. The remedial investigation determined that PCE, TCE, and other volatile organic compounds were contaminating the shallow and deep groundwater aquifers in a ten-square-mile area of the San Gabriel Valley around El Monte. Businesses in El Monte and surrounding areas had used these chemicals for degreasing, metal cleaning, and other purposes, and had probably released them to the ground through a combination of on-site disposal, careless handling, leaking pipes, and other means.

The study found that the uppermost, or shallow, aquifer includes most of the known sources of the groundwater contamination. VOC contaminant concentrations in portions of the shallow aquifer are hundreds of times drinking water standards (see Figure 2). In the deep aquifer, VOC contaminant concentrations are lower but still exceed drinking water standards (see Figure 3).

The NEMCTF has since continued to install and sample monitoring, extraction, and compliance wells, model the groundwater aquifers, and evaluate options for discharging treated groundwater, all in order to prepare for the implementation of cleanup work.

EPA Adopts Cleanup Plan

On June 23, 1999, the EPA adopted a cleanup plan for the El Monte OU known as the *El Monte Operable Unit Record of Decision*. The plan addresses the contamination described in the RI/FS. The goals of the 1999 cleanup plan are to prevent exposure of the public to VOC-contaminated groundwater, limit the movement of VOC-contaminated groundwater into clean or less contaminated areas and depths, reduce the impact of continued contaminant migration on downgradient water supply wells, and protect future uses of uncontaminated areas.

The 1999 cleanup plan calls for pumping the VOC-contaminated groundwater from two aquifers beneath the El Monte OU and treating it to remove the contaminants. More specifically, the plan calls for the construction and operation of groundwater extraction wells, treatment facilities, and conveyance facilities capable of pumping and treating approximately 1,325 and 330 gallons per minute of VOC-contaminated groundwater from the deep and shallow aquifers, respectively. The plan will require construction of new wells and treatment facilities for the shallow aquifer. For the deep aquifer, the plan allows for the use of existing water supply wells, treatment systems, and pipelines if possible, and the construction of new facilities where needed. Final decisions on extraction rates and locations will be made during the remedial design phase of the project.

Reason for this Action: Detection of Perchlorate, Hexavalent Chromium, NDMA, and 1,4-Dioxane in the El Monte OU

After the discovery in 1997 and 1998 of perchlorate, NDMA, and 1,4-dioxane in the Baldwin Park area, and hexavalent chromium in the San Fernando Valley approximately 10 miles northeast of the San Gabriel Valley, the Los Angeles Regional Water Quality Control Board requested that facilities in several areas of the San Gabriel Valley, including the El Monte OU, sample their groundwater monitoring wells for these "emergent chemicals." In 2000 - 2001, the NEMCTF and its members sampled selected shallow groundwater monitoring wells within areas of VOC contamination as part of the pre-design activities in the El Monte OU and tested for emergent chemicals. Perchlorate, hexavalent chromium, NDMA, and 1,4-dioxane were detected in shallow groundwater in the El Monte OU.

Maximum concentrations of perchlorate and NDMA exceed the State drinking water action levels of 4 ppb and 0.010 ppb, respectively. The maximum concentration of 1,4-dioxane is more than 20 times the State drinking water action level of 3 ppb. The maximum concentration of hexavalent chromium does not pose a risk to human health but exceeds the Federal standard for protection of freshwater aquatic life in inland surface waters and is of concern if treated water is discharged to surface water. Figures 4, 5, 6 and 7 depict the approximate extent of perchlorate, hexavalent chromium, NDMA and 1,4-dioxane contamination in shallow groundwater in the El Monte OU.

Sampling of groundwater in the deep aquifer of the El Monte OU shows that perchlorate is the only one of the four constituents that has exceeded the State drinking water action level. Perchlorate was detected at a concentration of 5.9 ppb in a well that was subsequently destroyed. Perchlorate was not detected in wells downgradient of the destroyed well and thus additional treatment processes for groundwater extracted from the deep aquifer in the El Monte OU are not anticipated to be necessary at this time, but may be required in the future.

In July 2001, EPA sent *Special Notice* letters to 27 PRPs to begin formal EPA-PRP negotiations to obtain a binding commitment from the PRPs to carry out the El Monte cleanup plan for the design, construction, and operation of the groundwater extraction, treatment, and discharge facilities specified in the El Monte OU ROD. EPA is currently negotiating this commitment, called a Consent Decree, including provisions for treatment of emergent chemicals, if warranted, with a group of El Monte OU PRPs.

Because the emergent chemicals were discovered after EPA issued the El Monte OU ROD, EPA is now modifying the cleanup decision to address the emergent chemicals. The emergent chemicals may require treatment, and if so, one or more of the treatment technologies described below will be required. To the extent treatment is required for the emergent chemicals, the groundwater has to be treated to achieve the treatment levels described below.

Table 1 shows the significant differences between the remedy as presented in the 1999 ROD and the action now proposed.

Description of Treatment Options

Perchlorate

Since 1997, when perchlorate was discovered in the San Gabriel Valley groundwater basin, technology for removing perchlorate from groundwater has made great strides. The California Department of Health Services (DHS) has determined that two perchlorate removal technologies are acceptable: biological treatment and ion exchange.

In the biological treatment process, nutrients are added to the contaminated water to sustain microbes that destroy perchlorate. The microbes convert the perchlorate ion to oxygen and chloride, which are present at low levels in all drinking water. The biological treatment process is being used in a full-scale treatment system at the Aerojet Superfund site in northern California. Biological treatment methods are new to many water utilities, but *biologically active* filters have been used in drinking water treatment for decades to help remove particles and biodegradable organic matter.

The second perchlorate-removal technology is ion exchange, in which the perchlorate ion is replaced by chloride, a chemically similar but non-toxic ion. Ion exchange processes have been used in homes and businesses for *softening* hard water for decades. In the Spring of 2001, a 2,500-gallon-per-minute groundwater treatment system using ion exchange to remove perchlorate went online in the Baldwin Park Operable Unit, producing potable water for use in the San Gabriel Valley. The principal disadvantage of ion exchange systems is that they only remove the perchlorate, they don't destroy it, and the perchlorate still needs to be appropriately managed after it is removed.

Both biological treatment and ion exchange processes have an added benefit. The groundwater in some parts of the San Gabriel Valley, including portions of the shallow aquifer in the El Monte OU, is unusable because of high levels of nitrate believed to be the result of past agricultural practices in the Valley. Both treatment process would also remove much of the nitrate from the water.

Other technologies have been proven capable of removing perchlorate from water, but probably at a higher cost. Liquid-phase granular-activated-carbon (LGAC) filtration can potentially remove perchlorate, but only for a limited period of time before regeneration or replacement of the carbon is required. Frequent carbon replacement would make relying solely on LGAC for perchlorate removal very expensive. Conventional filtration, sedimentation, or air-stripping technologies cannot remove perchlorate from water.

Hexavalent Chromium

Ion exchange treatment can remove hexavalent chromium from groundwater just as it does perchlorate. A benefit of using ion exchange treatment is that it would remove both perchlorate and hexavalent chromium from the water. Reverse osmosis will also remove hexavalent chromium from groundwater, but is much more expensive to operate than the ion exchange process. Chemical reduction technologies can also remove hexavalent chromium from water. Chemical reduction involves adding a chemical to provide a source of electrons to reduce hexavalent chromium (Cr^{+6}) to trivalent chromium (Cr^{+3}), which precipitates from the water. Though chemical reduction is comparable in cost to ion exchange treatment for removing hexavalent chromium, it does not also remove perchlorate from the water as ion exchange treatment does.

NDMA and 1,4-Dioxane

Ultraviolet (UV) light can remove NDMA from groundwater. In a UV treatment system, the water passes though a tank containing numerous ultraviolet lamps. The NDMA molecules absorb the light energy, which cause them to break down into smaller nontoxic molecules. UV light treatment, in combination with injection of an oxidant such as hydrogen peroxide, also removes 1,4-dioxane. UV treatment systems have successfully removed both chemicals from water in locations throughout the United States. A 2,500-gpm treatment system using UV with oxidation for NDMA and 1,4-dioxane removal is in operation in the Baldwin Park Operable Unit of the San Gabriel Valley sites.

Treatment Levels

Drinking Water Standards

The treatment technologies used in the El Monte OU will have to be capable of effectively and reliably removing VOCs, and, if necessary, perchlorate, hexavalent chromium, NDMA, and 1,4-dioxane, from the groundwater. If any of the treated groundwater, shallow or deep, is to be used as drinking water, treatment technologies must reduce the concentrations of all contaminants to below Federal and State drinking water standards in existence at the time that the water is treated, as measured at the consumers' taps. Generally, the applicable drinking water standard is the Maximum Contaminant Levels (MCL) established by State and Federal regulation. However, while MCLs have been established for some of the chemicals in the groundwater in the El Monte OU, none of the recently detected "emergent chemicals" has a MCL. *Total* chromium (e.g., Cr^{+3} and Cr^{+6} concentrations combined) has a MCL of 50 ppb, which is considered to protect the public's health from hexavalent chromium.

Safe levels for some chemicals that lack MCLs are specified by *action levels* developed by the California Department of Health Services (DHS). DHS has established action levels for perchlorate (4 ppb); NDMA (0.010 ppb); and 1,4-dioxane (3 ppb). Although not an enforceable standard, an action level is the concentration of a contaminant in drinking water that DHS has determined, based on available scientific information, provides an adequate margin of safety to prevent potential risks to human health. California Health & Safety Code Section 116455 requires that the operator of a public water system notify local government authorities when a drinking water well exceeds an action level. In addition, DHS recommends that drinking water purveyors notify the public if action levels are exceeded, unless the wells in question are taken out of service.

Applicable or Relevant and Appropriate Requirements: Water Quality Standards

EPA's cleanup plan also allows for recharging some or all of the treated water, that is, pumping it back into the groundwater basin instead of delivering it for use as drinking water. As discussed in greater detail in the Record of Decision, any recharged water must comply with the pertinent water quality objectives in the Los Angeles Regional Water Quality Control Board Basin Plan. In addition, State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," applies to any recharge of treated groundwater into the aquifer. Resolution No. 68-16 requires maintenance of existing State water quality unless it is demonstrated that a change will benefit the people of California, will not unreasonably affect present or potential uses, and will not result in water quality less than that prescribed by other State policies. In addition, in accordance with the Clean Water Act, EPA has established water quality goals for organic and inorganic constituents in water discharged to inland surface waters. These goals, referred to as the California Toxics Rule (CTR), were established to be protective of human health and freshwater aquatic life. The goal for hexavalent chromium is a 4-day average concentration of 11 ppb. In light of these requirements, any groundwater recharged into the aquifer, including water discharged to surface water channels, must be below action levels of 4 ppb for perchlorate, 0.010 ppb for NDMA, and 3 ppb for 1,4-dioxane, and below the CTR goal of 4-day average concentration of 11 ppb for hexavalent chromium.

The treatment levels discussed above apply to the groundwater after it is pumped above ground. Though the 1999 cleanup plan for the El Monte OU established contaminant levels to meet the objective of limiting the movement of contaminated groundwater into clean or less contaminated areas and depths, neither the 1999 cleanup plan nor this update establish cleanup levels for water in situ (i.e., in the aquifer). EPA plans to evaluate in-situ cleanup levels in a future action, as part of the final Record of Decision for the El Monte OU.

In 1999, the EPA estimated the cost of the cleanup at $8 million in capital costs and $960,000 per year for operation and maintenance costs. EPA's revised cost estimate, which includes additional treatment for removing the newly detected chemicals in shallow groundwater, is a potential $13 million in capital costs and $1.5 million per year in operation and maintenance costs. The revised cost estimate is based on evaluation of the latest treatment options for the newly detected chemicals and on extraction and treatment rates from the 1999 cleanup plan.

The additional treatment technologies that may be needed to remove the new contaminants are responsible for the increase in the estimated cost of the cleanup in the El Monte OU.

Final Selection of Treatment Technologies

EPA will select the final treatment technologies for the El Monte OU over the next year during completion of pre-design activities and the design of the El Monte cleanup facilities. During this time, additional cost and performance data from operation of full-scale treatment systems in the San Gabriel Valley and the results of treatment studies elsewhere will become available. EPA will incorporate this information into the selection of treatment technologies for the El Monte OU.

State Concurrence

The State of California, through the Department of Toxic Substances Control and the Los Angeles Regional Water Quality Control Board, supports the changes described in this document.

Statutory Determination

The modified cleanup plan for the El Monte OU remains protective of human health and the environment and will continue to meet all applicable or relevant and appropriate requirements identified in the 1999 Record of Decision, as required by CERCLA Section 121(d).

Public Participation Compliance

Several EPA community involvement opportunities have occurred in response to EPA and PRP actions in the El Monte OU. EPA issued an update on the San Gabriel Valley Superfund Sites in April 1998, which mentioned development of an "early action" project for the El Monte OU. EPA's Proposed Plan to address groundwater contamination in the El Monte OU was mailed in October 1998 with a 60 day public comment period. This was followed by a community meeting on the Proposed Plan where the public was again given the opportunity to comment. EPA addressed all comments on the Proposed Plan in a Responsiveness Summary attached to the 1999 ROD. The community meeting was followed by a fact sheet issued in July 1999, in which EPA updated the status of the El Monte OU interim remedy design activities. And, EPA issued an update on the San Gabriel Valley Superfund Sites in May 2002, which mentioned the detection of perchlorate, hexavalent chromium, NDMA, and 1,4- dioxane in the shallow groundwater of the El Monte OU.

An ESD notice was published in July 2002 in a local newspaper as required by the NCP, section 300.435(c)(2)(i)(B). The public participation requirements set out in the NCP, sections 300.435(c)(2)(i) and 300.825(a)(2) will continue to be met.

/Signed/
John Kemmerer, Chief
Superfund Site Cleanup Branch
U.S. Environmental Protection Agency, Region 9

August 22, 2002
Date

200

Table 1. Comparison of Cleanup Plans – Most Aspects of the 1999 Plan Have Not Changed

	ORIGINAL CLEANUP PLAN	UPDATED CLEANUP PLAN
Remedial Objectives	Prevent exposure, limit further migration of contaminated groundwater, reduce impacts on down-gradient water supply wells, protect future uses of clean areas.	Same
Groundwater Extraction Areas	Extract groundwater from the deep aquifer and two areas of contamination in the shallow aquifer	Same
Groundwater Extraction Rates	Extract contaminated groundwater at rates needed to meet remedial objectives. Determine final rates during remedial design. Initial estimate was 1,325 gpm deep and 330 gpm shallow	Same
Groundwater Treatment Technologies light	Use air stripping and carbon treatment to remove VOCs from the groundwater . Finalize technologies during remedial design	Use same technologies to remove VOCs. Potentially use ion exchange to reduce perchlorate and hexavalent chromium, UV to remove NDMA and with oxidation, 1,4-dioxane. Select technologies during remedial design.
Groundwater Treatment Standards	Design treatment systems to reduce VOC concentrations to below MCLs	Reduce VOC concentrations to below MCLs, reduce perchlorate, NDMA, and 1,4-dioxane concentrations to below State action levels, and hexavalent chromium to Federal surface water goals
Use of Treated Groundwater	Supply deep water to water companies for distribution, return shallow water to the groundwater basin or supply to industries. Make final decision during remedial design	Same
Project Costs	Estimated capital costs of $8 million; estimated operation and maintenance costs of $960,000/ year	Estimated capital costs potentially increase to $13 million; estimated operation and maintenance costs potentially increase to $1.5 million/year

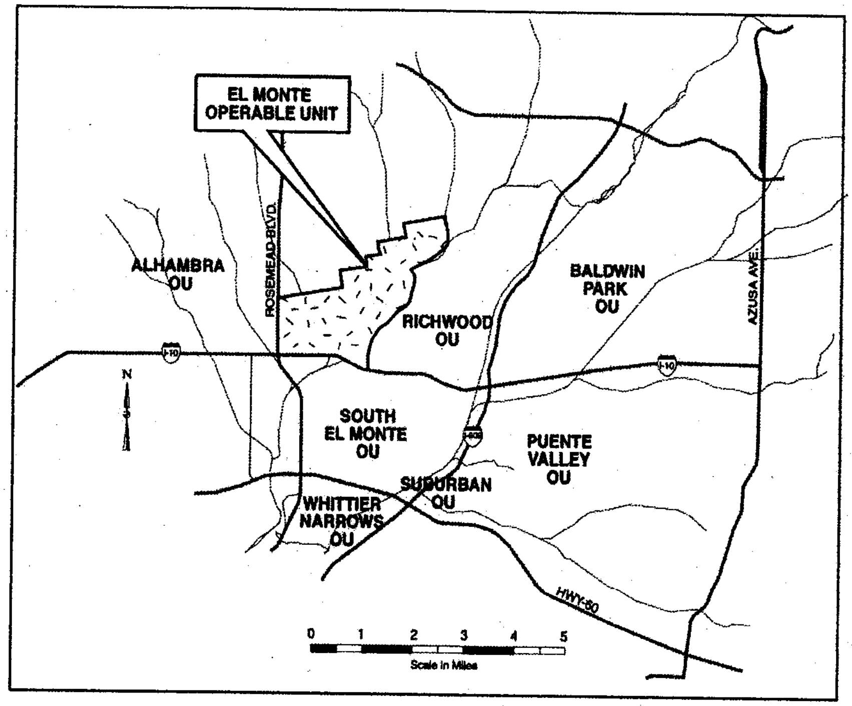


Figure 1: Location of the El Monte Operable Unit and other San Gabriel Valley Superfund Site Projects

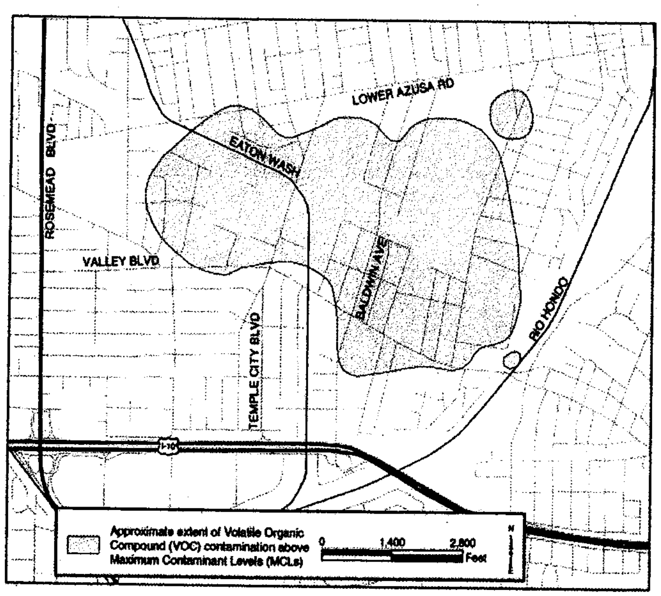


Figure 2: Approximate extent of VOC contamination in shallow groundwater

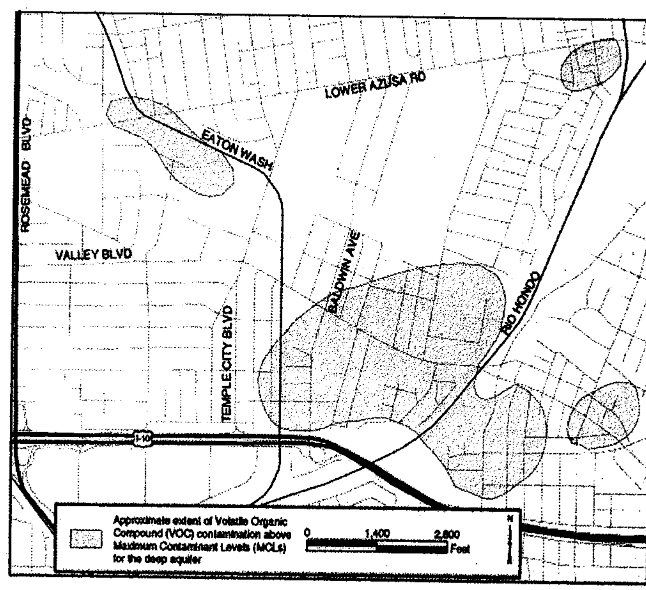


Figure 3: Approximate extent of VOC contamination in deep groundwater

202

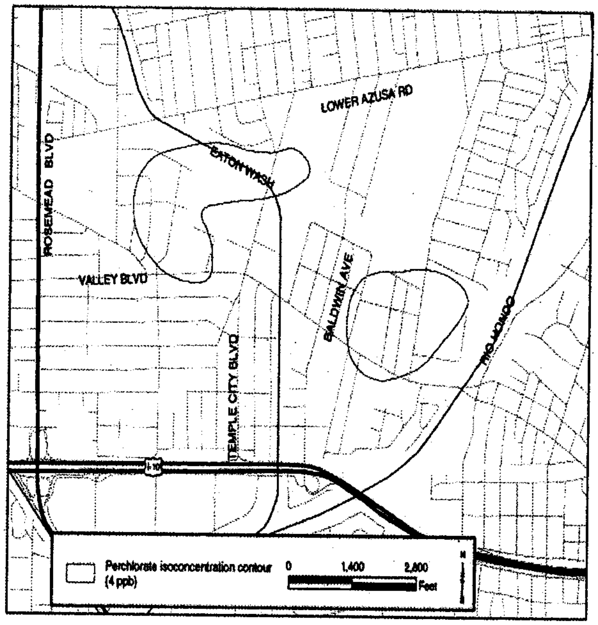


Figure 4: Approximate extent of Perchlorate contamination in shallow groundwater

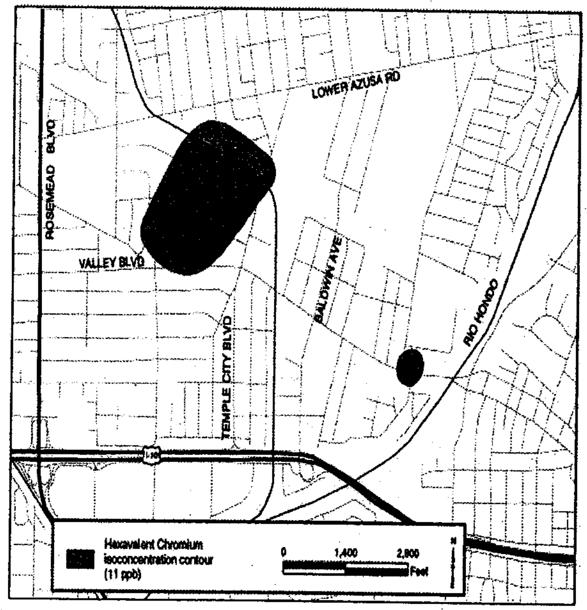


Figure 5: Approximate extent of Hexavalent Chromium contamination in shallow groundwater

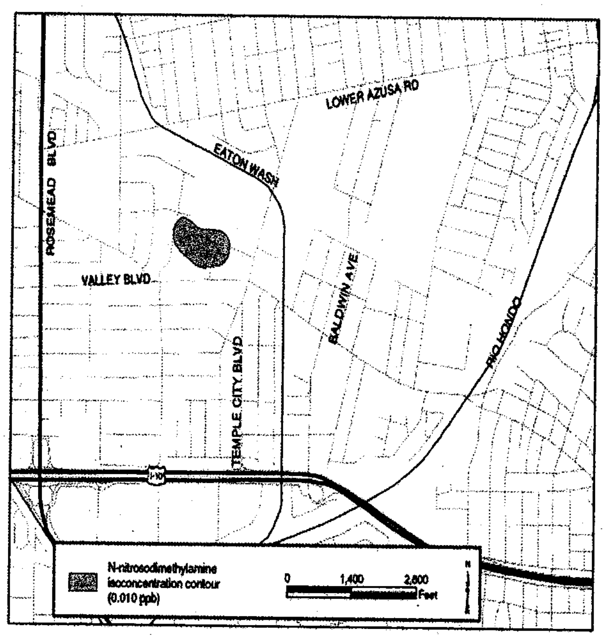


Figure 6: Approximate extent of NDMA contamination in shallow groundwater

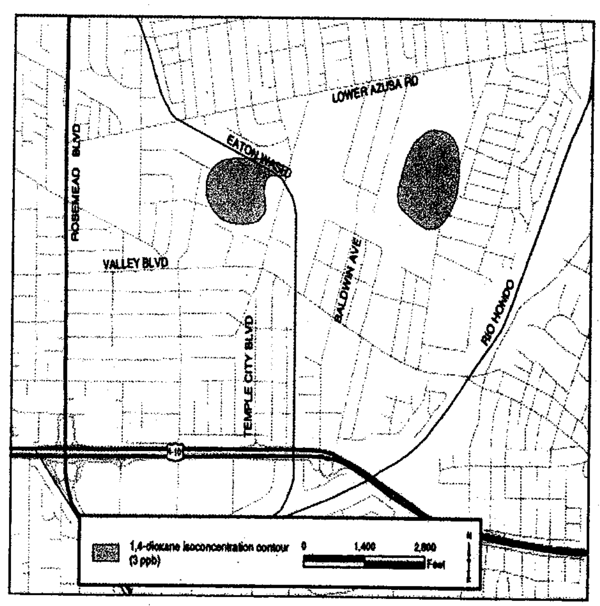


Figure 7: Approximate extent of 1,4-Dioxane contamination in shallow groundwater